THE YEARBOOK OF INDUSTRY

IRON TRADE REVIEW

Registered U.S. Patent Office

CLEVELAND, O., JANUARY 5, 1928

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BLAST FURNACE GAS
to heat
BECKER OVENS
of the
BY-PRODUCTS COKE CORPORATION

IN 1924, 110 Becker Type ovens, heated with Coke Oven Gas, were placed in operation for the By-Products Coke Corporation at South Chicago. These ovens have a surplus gas output of approximately 20,000,000 cubic feet per day.

The By-Products Coke Corporation is now installing a Blast Furnace Cleaning Plant so that these ovens may be heated with blast furnace gas. This will release 12,000,000 additional cubic feet of gas for outside use.

The ability of these ovens to be heated by Blast Furnace gas as well as by the more valuable coke oven gas is a unique feature of Becker oven design.

The Koppers Construction Company

Chicago **Pittsburgh** **New York**

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IRON TRADE REVIEW

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Jan. 5, 1928

The Authority of Industry — National and International

Important Work Is Ahead

MERICAN industry crosses the threshhold of the new year with well-defined work cut out for it. Caution lest the bugaboo of presidential year inject its subtle influence into the veins of business will be in order. Courage to face the trials of relentless competition and to withstand the onslaughts of continued low prices will be needed. Sound judgment must be exercised in every effort calculated to restore the balance between production and consumption.

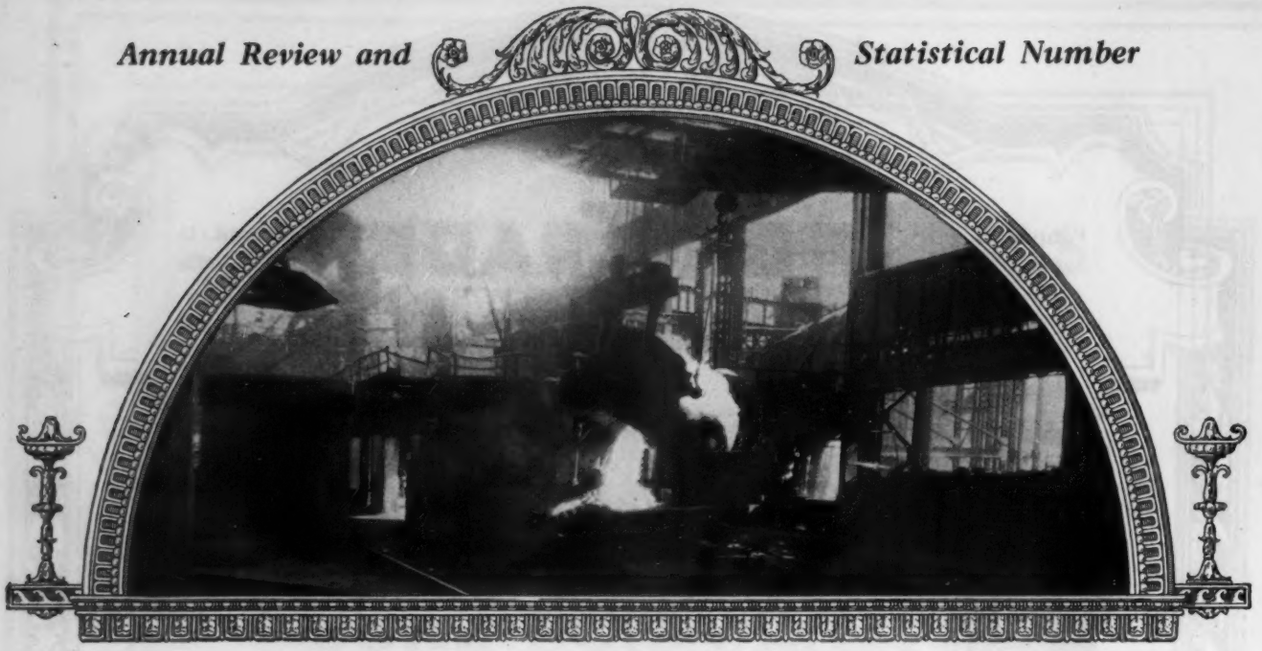
Much of this burden rests on the shoulders of the leaders in the various branches of industry, each of which has its own peculiar problems. In iron and steel, the responsibility in 1928 will be particularly heavy due to the passing in 1927 of E. H. Gary, J. G. Butler Jr., Powell Stackhouse and others whose example, direction and counsel have been influential during a span of many years. Those who have assumed their mantles are charged with carrying on the best traditions of the former leadership and at the same time defining the policies, prescribing the action and marshaling the forces necessary to cope with new situations.

Numerous external problems demand attention. Adequate machinery for systematic development of new markets is lacking. The relationship of steel to other industries and to the public leaves much to be desired. Questions of internal character are equally important. Constant realignment of units call for frequent adjustments. Scientific research should be encouraged. The statistical services of the industry may well be expanded and better co-ordinated. Practices of selling and distribution could be standardized and codified with advantage.

Primarily these are tasks of human engineering, involving the development of an *esprit de corps* throughout the rank and file of producers, fabricators and consumers. Their successful accomplishment requires not only leadership of the highest caliber, but also an attitude of co-operation on the part of every individual in the industry.

Anything short of smooth-running teamwork all along the line will jeopardize the key position of steel in American industrial prosperity.

Annual Review and *Statistical Number*



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The Authority of Industry National and International

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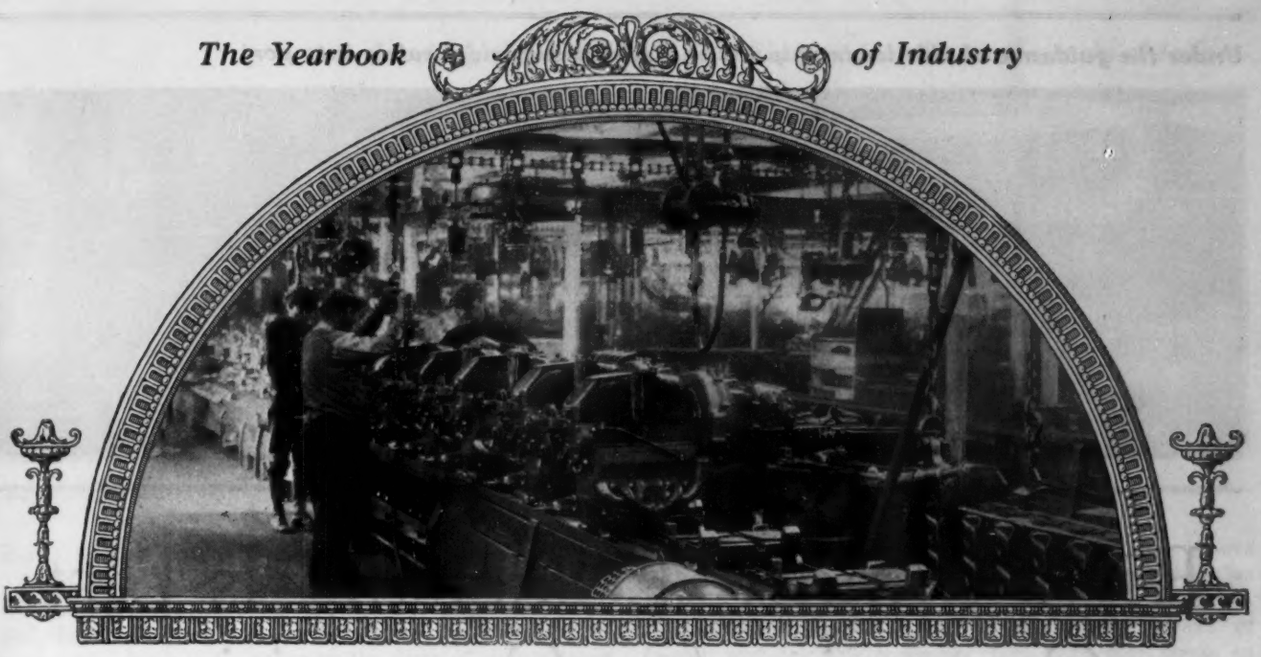
CONTENTS, January 5, 1928

General Articles

Important Work Is Ahead		**1**
Right-Minded Leadership Is Best Corrective for Competition	By E. L. Shaner	**4**
Intense Competition Gives Great Impetus to Merger Movement	By John W. Hill	**6**
Creation of New Markets Aid to Selling Problem	By R. T. Mason	**9**
Industry Advancing by Improving Labor Conditions		**13**
What Ails Merchant Pig Iron Industry?	By J. F. Froggett	**17**
Diary of Iron and Steel Industry for 1927		**20**
Single Price on Heavy Steel Emerges from Brisk Market	By E. C. Barringer	**22**
Steel Prices Key to Better Day in Iron Ore Industry	By A. J. Hain	**25**
Progress In Engineering Rises to New Heights in 1927		**29**
Advance in Design and Operation of Blast Furnaces Continues		**30**
Steelmakers Seek Improvement in Open-Hearth Practice		**31**
New Ideas Overturn Traditions in Rolling Mill Industry		**32**
1927 Witnesses Marked Advance in Processes of Fabrication		**34**
Mechanics of Heat Treating Better Appied		**36**
Foundrymen Gain in Metallurgy and Handling of Material		**38**
Refractories Research Points Way to Quality and Uniformity		**39**
Refinement Is Mark of Recent Machine Tools		**40**
Recession in Alloy Steel Output Is Slight		**42**
Where Steel Was Consumed in 1927		**44**
Steel Foundry Capacity Is Excessive	By W. J. Corbett	**48**
Industry Continues Steady Building; Keeps Pace Set by Preceding Years	By George H. Manlove	**57**
By-Product Coke Oven Expansion Feature of 1927 Construction	By John D. Knox	**61**

The Yearbook of Industry



The Business Trend

By John W. Hill

Blast Furnace Index 49
Pig Iron Production 51
Steel Ingot Production 51
Steel Price Index 51
Iron and Steel Foreign Trade 52
Freight Car Awards 52
Bituminous Coal Production 52
Freight Car Traffic 53
Freight Car Situation 53
Automobile Production 53
Credit Situation 54
Security Market 54
Bradstreet's Index 54
Building Construction 55
Detroit Employment 55
Cost of Building 55
Foreign Trade 56
Cost of Living 56
Employment Index 56

Domestic Market Reviews

Prepared by Staff Representatives

W. H. Lloyd.....Pittsburgh
F. B. Pletcher.....Chicago
H. R. Simonds.....Boston
E. C. Kreutzberg....New York
W. J. Nolle.....New York
B. K. Price.....New York

1927 Output Good but Buyers Rule and Markets Falter.....By E. C. Barringer 74

Pig Iron 77
Coke, Semifinished 78
Pipe 79
Scrap, By-Products 81
Wire, Tin Plate, Refractories 82
Shapes, Bars 83
Plates, Cast Pipe 84
Sheets, Rails 85
Ferroalloys 86
Strip, Nonferrous Metals 87
Warehouse 88

Pig Iron Production, 1855-1927 89
Prices Tell Market History 90-104

Foreign Market Reviews

Prepared by Staff Representatives

Vincent Delport.....London
Joseph Horton.....Birmingham
J. Leon.....Paris
Dr. E. H. Regensburger.....Berlin

European Iron and Steel Prices 106-108
Competition Acute in Europe 107
British Working Against Odds 109
Active Year for German Steel 111
French Industry Resists Crisis 113
Steel Prices Low in Belgium 115
Italy Is Planning for Future 116
Western Europe Is Progressing 117

World Output Makes Big Gain 118
Per Capita Production Is Smaller 121

CURRENT NEWS AND MARKETS

Weekly Market Review, Market Reports, Prices and Miscellaneous News 64-72
Pig Iron Production Statistics for December 71

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Under the guidance of able leadership the ship of business rides safely into port

Right-Minded Leadership Is Best Corrective for Competition

With Reduction of Competitive Units Through Merger and Expansion of Demand by Market Development at Home and Abroad, It Will Hasten Day of Stability

By E. L. Shaner

COMPETITION of the brand encountered by the majority of American industries in 1927 constitutes the acid test of management. Executives who successfully pilot their companies through the manifold dangers of a situation embracing excess plant capacity, low prices and narrowed margins of profit are likely to find the ordinary problems of business mere child's play.

Perhaps the dread of intense competition lies in the inability of most companies to escape its clutches. Its tentacles reach out to grip the large and small alike. Characterized as the life of trade, in an environment of suspicion, distrust and general misunderstanding it may well lead to the death of business.

Unfortunately the attitude of many who suffer most from the effect of ruthless competition is that of hopeless abandon. The average manufacturer decides to make the best of a bad situation by sitting tight and doing his level best to hang on until the storm clouds lift. In this position, he generally resorts to what appears to him to be the easiest form of self-preservaion—price-cutting. Determined to find enough business to keep his plant running, he adopts the methods necessary to take the business from a competitor.

Competition Is a Stern Reality

Price-cutting and the numerous other weapons employed to combat stern competition have been strongly condemned in many quarters, but it will take more than criticism to discourage their use. To the manufacturer facing ruin if his plant lies idle, competition is a reality and not a theory. In his fight for existence he will use the most effective methods at hand.

What then, is the solution of the problem? What, if anything, can be done to alleviate the strain on business caused by the present situation?

* * *

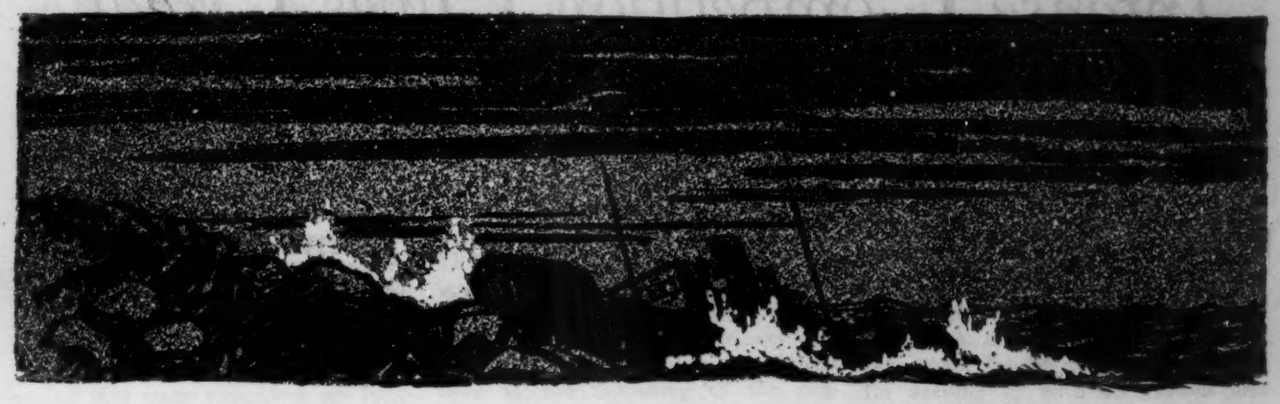
Relief can come from only two directions—curtailment of production or increase of demand. Each of these may be approached from a number of different angles, and for this reason the basic elements of the problem often are clouded by the conflicting theories set forth by those who discuss it.

Would Restrict Output Artificially

The past year has witnessed a tendency in certain quarters to favor the control of production by agreement. The apparent success of this plan as demonstrated by the European cartels has given impetus to the movement in this country. Numerous individuals and a few organizations advocate the changing of federal statutes to permit control of production under safeguarding supervision. Naturally these suggestions are frowned upon by economists and others who declare that it violates the age-old law of supply and demand. Moreover, it is doubtful whether public opinion would sanction such action.

The alternative to artificial restriction of production is to give free rein to the natural processes of competition by which the inefficient and unnecessary units of production are wiped out by economic pressure. The tendency in this direction already is well defined, as is

——But lacking that leadership it is likely to founder on the rocks of failure.



shown by the article beginning on page 6 of this issue.

Reduction in the number of competing companies through purchase and consolidation is progressing rapidly and the effect is sure to be beneficial. Abandonment of unprofitable businesses, either by the force of circumstance or by voluntary action, likewise helps the general situation.

* * *

FORTUNATELY the problem of increasing demand is less sinister in its various aspects than that of the control or restriction of production, for here the motive is constructive rather than restrictive and the opportunities are broader.

In a few industries the volume of demand is closely defined by the activity of the consuming field. This means that the producer must take business as it is offered. In lean periods he must struggle along as best he can, depending on the upward swings to restore him to a basis of adequate profit. A manufacturer operating under limitations of this kind finds it expedient to figure his overhead and fixed charges on a rate of production sufficiently low to protect him at all times. The temptation, of course, is to pitch the line of normal operations too high, and those who make this mistake are sure to regret their folly.

However, the majority of industries are not confined to inflexible markets. There are comparatively few materials and manufactured articles that are not susceptible to adaption to new uses. Herein lies the easiest approach to the increase of demand.

Conditions for the development of new markets never were more favorable than at the present time. The high purchasing power of the masses and the rapid change of goods from the category of luxuries to that of necessities smooth the way for the introduction of new services and new articles of trade.

Under such circumstances, the manufacturer who is not actively engaged in developing new uses for his production—either through his own resources or through the work of a co-operative organization—is overlooking one of the most potent weapons against competition. The extent of the opportunities in the creation of new markets is outlined in an article appearing on page 9 of this issue.

Export Field Offers Possibilities

Another outlet for goods when production greatly exceeds demand is the export field—a market whose attractiveness to manufacturers depends largely on the nature of their product. Many authorities firmly believe that American industrialists do not fully realize the value of export trade as a supplement to business at home. Julius Klein, director of the United States bureau of foreign and domestic commerce, lays particular stress on this point. He says:

"The value of foreign trade as an effective even though relatively moderate stabilizer of our general business position was never more clearly demonstrated than in 1927. Exports will exceed $4,925,000,000 and attain the substantial increase of 18 per cent in volume over 1926. This gratifying result represents a steady, normal rate of advance and was achieved in considerable measure by the efforts of several industries which, having suffered a slackening of domestic trade below the record figures of 1926, found a most helpful corrective through the more intensive exploitation of overseas markets."

In view of these facts, American business men would do well to study the foreign trade situation.

* * *

FROM the foregoing it is apparent that there are several avenues of orderly retreat from the grip of competition. None of them offers immediate relief, but by assiduously conducting their businesses so as to hasten in every way possible the operation of these corrective measures, manufacturers can contribute mightily to the attainment of the final objective—stability.

Caliber of Leadership Is Big Factor

This is a task for able leaders. It is work for individuals of broad vision, patience and unflinching courage. Petty jealousies, suspicion, selfishness and plain obstinacy must give way to a wholesome spirit of co-operation if progress toward stabilization is to be uninterrupted.

After all, many of the objectionable features of intense competition witnessed during the past year may be traced directly to an attitude of mind which was not in accord with the principles of good business. Plant a few vindictive spirits in dominant positions in an industry and that industry soon will be in the throes of price wars, back-biting and other destructive influences. By the same token, inject into the industry's leaders the attitude of co-operation, high principles and forbearance, and the effect in increased confidence, forward-looking action and constructive effort soon will be noticeable throughout the industry.

Guided by the light of such leadership, the captains of the ships of business can steer a safe course to the port of success. Without it, they are likely to crash on the rocks of adversity.

Intense Competition Gives Great Impetus to Merger Movement

Past Year Has Seen the Most Pronounced Tendency Toward Consolidation Since Beginning of the Present Century

By John W. Hill

ONE of the most significant developments in American business in 1927 was the increasing tendency toward industrial mergers. At no time since the very beginning of the present century has the merger movement been so pronounced and so persistent. In recent months scarcely a week has passed without its announcement of a consolidation consummated or planned.

This has been true in the steel, automobile, textile, rubber and furniture industries and in practically all important producing and distributing lines. Developments in the steel industry have been pointing toward a combination of middle western steel plants, and already in the past year there have been several noteworthy, though perhaps preliminary consolidations of companies.

The impetus has come from a three-pronged economic situation. The middle prong is that of severe competition, the other two being low prices and small profits. Competition, according to classic theory, is the life of trade, but of late a new competition has sprung up which frequently leaves in its wake a trail of red ink.

Reasons for Mergers

A PICTURE of what is happening is found in the year's records. During the first 11 months there were 21,000 commercial failures, an increase of 6 per cent over the total for the corresponding period of 1926. During those same months the indebtedness involved in the insolvencies was approximately $469,000,000 or nearly 30 per cent in excess of the aggregate indebtedness for the first 11 months of last year.

Net earnings of 252 companies in 18 different lines of enterprise in the first half of 1927 showed a decline of nearly 7 per cent below that of one year before. This decrease in earnings does not reflect in any important degree the industrial recession of the year because business did not go into a marked slump until the last half of the year. In fact among the most pronounced losses in earnings of all the large groups were those of the iron and steel, and petroleum industries in which productive activities reached high levels in the first six months of 1927.

Profits Are Small

NET profits for leading companies in the petroleum group in the first half of 1927 showed a reduction of 36 per cent compared with one year before, although output made a new record. In the iron and steel industry there was a loss of 8 per cent. In the third quarter of the year just closed leading companies of this proud industry averaged only 4.5 per cent on their aggregate capitalization. The average in recent years of prosperity activity has been less than 6 per cent on capitalization.

Therefore, it is necessary to look beyond the industrial let-down of recent months for the causes of the downward sweep of prices and of profits. The most plausible answer is found in the condition of overcapacity, which was brought about first by the stimulus of war demand, sustained by abundant credit reserves of the post-war period.

Recently the nation has witnessed notable advances in the art of quantity production. Today in modern plants of the iron and steel industry the average man is producing from one and one-half to eight times as much as he did 25 years ago. With the progress of quantity production, it was necessary that there be quantity consumption. Happily, mass output greatly lowered relative costs and prices and increased wage rates. This has tended to stimulate consumption and raise living standards to a high level. Modern supersalesmanship has played its part, employing the gigantic implements of national advertising, and instalment selling.

Out of all this has grown up the condition which is termed the new competition. This embraces not only the struggle for business between competing companies, but the competition between different classes of goods which can be used for similar purposes. It even goes further than that because with the multiplicity of modern convenience and luxuries, it was inescapable that competition would grow up between industries serving different wants, each making a bid for the consumer's dollar, his time and his attention.

In order to meet this competition industrial producers have been inclined to look to volumes as their only salvation, but frequently volumes have outdistanced the development and cultivation of adequate consuming markets. The result is the disposal of goods upon a buyer's market at an unprofitable price level. In the steel industry, particularly, great emphasis has been laid upon production at the expense of profitable distribution, and the consequences are to be read in current income statements.

Plants Modernized

SINCE 1914 the steel industry has put $2,000,000,000 in new plants and equipment, and yet the profits per ton of steel have shown no improvement. Not long ago a high official of a large steel interest discussing this condition said:

"In the last few years our company has spent large sums modernizing our works with the end in view of increasing efficiency and cutting costs. We have accomplished this aim. But to our surprise the company's earnings have shown no improvements whatever. This seems serious until it is noted that all the savings we have effected have been handed over with an over-generous

hand to consumers. There is only one consoling thought about this situation, and that is that if we had not made the improvements our company could not even keep its head above water today."

This picture is applicable to many establishments in almost every line of business. It has been found that volume in itself does not solve the problem of an adequate return upon capital invested. Neither does an increase in producing efficiency alone solve the problem, because the savings effected thereby have melted more often than not under the severe heat of competition.

Under these circumstances, it is no wonder that many executives are turning their thoughts toward some form of truce with competitors through mergers or co-operative action.

Battle of Giants

AMONG great producers and distributors present competition is indeed a battle of giants. Though much of the country's business still is carried on by small firms, there is a striking and significant trend toward the ascendency of larger units. From 1923 to 1925 there was a loss of 4.2 per cent in the number of American factories, but a gain of 4 per cent in the value of their products. There are 65,000 fewer business concerns in business today than there were at the beginning of the century.

In some lines this diminution in the number of separate units is marked. Of the some 1000 companies which started in the manufacture of automobiles since the infancy of that industry there now are only about 50 of sufficient importance to display their products at the great national automobile shows. And of this total about one half dozen companies produce nearly 90 per cent of all the automobiles made in the country.

Larger companies frequently are better able to withstand the welter of competition than smaller ones. They can demand more capital for the protection of their markets and for keeping up with the furious and bewildering procession of new me-

Industrial Reorganizations Are Numerous in 1927

The following is a partial list of the more important industrial consolidations of the past year as compiled from IRON TRADE REVIEW:

Acme Machine Products Co.....Acquired Muncie Screw & Cap Co.
Allegheny Steel Co.....Purchased Delaware Seamless Tube Co.
Allis-Chalmers Mfg. Co.....Acquired Pittsburgh Transformer Co.
American Brass Co.....Acquired Detroit Copper & Brass Rolling Mills
American Radiator Co.
Purchased Hummer Engine Works of Montgomery Ward & Co.
American Rolling Mill Co.
Acquired Norton Iron Works and Ashland Steel Co.
American Rolling Mill Co.....Purchased Columbia Steel Co.

Bethlehem Steel Co. .....Acquired Robesonia Iron Co.
Bigelow-Liptak Corp.
Consolidation of Liptak Firebrick Arch Co.; and Bigelow Arch Co.
Blaw-Knox Co. .....Purchased Milliken Bros. Mfg. Co.
Bucyrus-Erie Co.
Consolidation of Bucyrus Co.; and Erie Steam Shovel Co.

Carborundum Co. .....Purchased American Resistor Co.
Chase Companies Inc.
Consolidation of Chase Companies Inc.; and U. T. Hungerford Brass & Copper Co.
Cleveland Pneumatic Tool Co.
Acquired Westinghouse Air Spring Co.
Consolidated-Asheraft-Hancock Inc.
Consolidation of Hancock Inspirator Co.; Hayden & Derby Mfg. Co.; Asheroft Mfg. Co.; and Consolidated Safety Valve Co.
Continental Steel Corp.....
Consolidation of Superior Sheet Steel Co.; Kokomo Steel & Wire Co.; and Chapman-Price Steel Co.

Eastern Nail Works Co. .....Acquired Tremont Nail Co.
Empire Steel Corp.
Consolidation of Mansfield Sheet & Tin Plate Co.; Ashtabula Steel Sheet Co.; Empire Steel Co.; Thomas Sheet Steel Co.; Waddell Steel Co.; and Falcon Steel Co.

Fairbanks, Morse & Co.
Purchased scale business of Fairbanks Co.
Farrel-Birmingham Machinery Corp.
Consolidation of Farrel Foundry & Machine Co.; and Birmingham Iron Foundry
Foote Bros. Gear & Machine Co.....Purchased A. Plamondon Mfg. Co.
Forest City-Walworth Run Foundries
Consolidation of Forest City Foundry & Mfg. Co.; and Walworth Run Foundry Co.
Fuller-Lehigh Co.
Purchased pulverized fuel equipment business of Bailey Meter Co.

Garden City Machine Works
Consolidation of Garden City Machine Works; and Missoula Iron Works.
General-American Tank Car Corp.....
Acquired control of Standard Tank Car Co. from Keith Car & Mfg. Co.
General Bronze Corp.
Consolidation of John Polachek Bronze & Iron Co.; and Renaissance Bronze Iron Works
General Cable Corp.
Consolidation of Standard Underground Cable Co.; Dudlo Mfg. Co.; Rome Wire Co.; Safety Cable Co.; and Baltimore Copper Smelting & Rolling Co.
General Laundry Machinery Co.
Consolidation of Tolhurst Machine Works; and Tilley-Ellis Co.
Geometric Stamping Co.
Purchased automotive muffler division of A-C Spark Plug Co. and Gray-Hawley Mfg. Co.

Hajoca Corp.
Consolidation of Haines, Jones & Cadbury Co.; Keystone Supply & Mfg. Co.; Bridgeman Co.; and Krupp Foundry Co.
Hamilton Caster & Mfg. Co.....Purchased Zering Mfg. Co.
Harbison-Walker Refractories Co.
Acquired Walsh Fire Clay Products Co.
Heald Machine Co.
Purchased grinding machine business of Giddings & Lewis Machine Tool Co.

Industrial Brownhoist Corp.
Consolidation of Brown Hoisting Machinery Co.; and Industrial Works.
International Combustion Engineering Corp.....
Acquired Heine Boiler Co.
International Molding Machine Co.
Purchased Henry E. Pridmore Inc.

Kalman Steel Co.....Acquired Sykes Metal Lath & Roofing Co.
Kelsey-Hayes Wheel Co.
Consolidation of Kelsey Wheel Co.; and Hayes Wheel Co.

Laclede Steel Co.....Purchased Southern States Steel Co.

Macomber Steel Co.
Consolidation of Canton Bridge Co.; and Massillon Steel Joist Co.
M. A. Hanna Co.....Purchases Rogers, Brown Iron Co.
Malleable Iron Fittings Co.....Purchased Clark-Williams Engineering Co.
Massillon Power Shovel Co.
Purchased shovel business of Russell & Co.; and Massillon Foundry & Machine Co.
Mid-West Forging Co.
Purchased tube manufacturing facilities of Century Fence Co.

National-Harris Wire Co.
Consolidation of Harris Alloys Inc.; and Murray-Harris Wire Co.
National Radiator Corp.
Consolidation of National Radiator Co.; Niagara Radiator & Boiler Co.; Continental Heater Corp.; Utica Heater Co.; Union Radiator Co.; and Gurney Heater Mfg. Co.
Newton Die Casting Corp.
Consolidation of Die Casting division of National Lead Co.; and Marf Machine & Die Casting Corp.

Remington Rand Inc.
Consolidation of Remington Typewriter Co.; Rand Kardex Bureau Inc.; Dalton Adding Machine Co.; and Baker-Vawter Looseleaf Ledger Co.
Republic Iron & Steel Co.....Purchased Trumbull Steel Co.
R. H. Beaumont Co.....Acquired American Mfg. & Engineering Co.

Shaw Crane-Putnam Machine Co.
Consolidation of Putnam Machine Co.; and Shaw Electric Crane Co.
Shenango Furnace Co. .....Acquired Penn Mold & Mfg. Co.
Shepard Electric Crane & Hoist Co.
Purchased Sprague Electric Works of General Electric Co.
Shepard Elevator Co.....Purchased John J. Brice Foundry Co.
Simonds Saw & Steel Co. .....Purchased Abrasive Co.
Splitdorf Electric Co.....Purchased American Electric Motors Inc.
Standard Slag Co.....Purchased Bessemer Limestone & Cement Co.
Steel & Tubes Inc.
Consolidation of Elyria Iron & Steel Co.; and Mohegan Tube Co.
Swartwout Co. .....Purchased S. C. Regulator Co.

Union Mfg. Co.....Purchased Franklin Moore Co.
United States Refractories Corp.
Purchased Savage Mountain Fire Brick Co.
Utilities Power & Light Corp....Purchased St. Louis Gas & Coke Corp.

Walker Vehicle Co.....Purchased Automatic Transportation Co.
Western Loggers Machinery Co.....Purchased Caterpillar Tractor Co.
Western Steel Co.....Purchased Utah Steel Corp.
Westinghouse Electric & Mfg. Co.
Absorbed Westinghouse Electric Products Co.; and George Cutter Co.

chanical developments. One economist who notes that the larger companies have had greatest success suggests that a big company is not necessarily efficient because it is big but it is big because it has been efficient. Be that as it may be, the truth is that individual and relatively smaller companies in the great competitive industries are finding it more and more difficult to stand alone under present conditions.

Conditions Forced Consolidations

A parallel for this situation is found in the state of affairs existing at the beginning of the present century when the great merger movement then under way, was culminated by the huge combination known as the United States Steel Corp. Describing the tendency of those times applied to the iron and steel industry, Ida M. Tarbell in her life of Elbert H. Gary says:

"It is not to be supposed that these consolidations which followed so rapidly were simply sudden runnings to cover of scared interests or that they were forced by some superior sinister individual determined that a particular business should belong to him. For many years almost daily changes in the making of steel and its products, the enormous amount of fresh capital desperately in demand, the lawless methods of competition, the indifference to contracts, as well as a growing feeling that demand could only be met with economy and regularity by larger units, had grown almost unconsciously on men in the trade. They were yielding to forces greater than any man or group of men could cope with."

All of these conditions do not exist today in the steel industry or in other industries. Certainly methods of competition are less lawless and there is a higher standard of ethics with reference to contracts. But there is no denying that an excess of producing capacity exists in many industries. Its result is a craving for volumes on the part of producers with the attendant necessary for cutting prices to unprofitable levels.

In the petroleum industry the tremendous overproduction is a matter of national concern because of the profligate waste of natural resources. Now for the first time the industry is making what apparently is a well planned effort to get the situation in hand. This is not so much through mergers but through voluntary control. Legislative restrictions are threatened if this is not successful, and the American Petroleum institute has gone on record as favoring such legislation. This would aim at the same result of market stabilization as is sought by gigantic mergers or co-operative action between producers.

In the cotton textile industry great excessive capacity has grown up largely because of the expansion of spindles in the South close to the source of supply of raw materials and cheaper labor. This has moved much of of the cotton mill industry away from New England. Meanwhile, manufacturers are adopting co-operative movements, and recently announcement was made of plans for a larger merger of Southern cotton mills.

The same story might be told of a dozen other great lines. Existing conditions not only are compelling defensive alliance among competitors in identical lines, but it is forcing them to seek extension of their consuming markets through exploiting and developing new fields.

The swift advances in the science of production in recent years have played a leading part in the creation of large units. Likewise they have made equipment obsolete, thereby creating idle capacity, which hangs like a black cloud over the markets but which is really inefficient.

Plants with obsolete equipment are numerous in the steel industry and the maintenance of these inefficient units is considered a handicap to the industry. The only solution is to find a way to scrap it. Individual companies are not in position to do this, but by means of a combination of interests obsolete high cost equipment could be and, in many cases, frequently is, scrapped and production is concentrated in the more highly efficient and low cost works.

One of the most important benefits to be derived from a merger of independent plants is the check placed upon needless competitive expansion of producing units.

In the recent consolidation of the Republic Iron & Steel Co. and the Trumbull Steel Co., it was pointed out that the most important result was the giving to Republic additional finishing capacity which it needed, and the provision of Trumbull with additional steel capacity which it needed. In this combination there was avoided an expansion of plants of both companies which would have added to the sum total of an already over-expanded capacity in the country, and thus increase the pressure of potential capacity upon prices and the market.

The experience of past mergers in the industry has been similar. Since its inception in 1901 the United States Steel Corp. actually has dismantled 61 plants. Since the incorporation of the Republic Iron & Steel Co., in 1901 as the "bar iron trust" it has dismantled 25 separate wrought iron mills in seven states. Notwithstanding these facts production totals have continued to climb.

There is a financial side to this picture. Wherever excessive capacity exists in obsolete form, it usually is represented in the company's capital structure in the form of bonds or preferred stock. If such is the case it means that a fixed charge exists upon the earnings of the company for equipment from which earnings are no longer possible. If the equipment is scrapped the fixed charge remains to sap the company's finances.

Financial Details Important

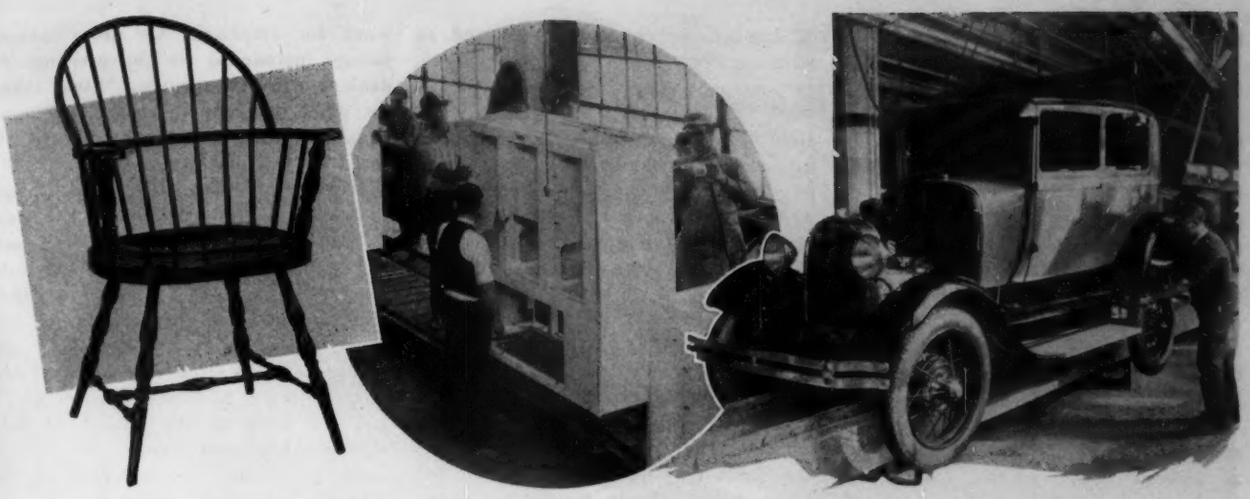
The solution of this problem often is sought by the reduction of fixed charges represented by preferred stock and funded debt. This may be done by giving common stock for preferred in arranging security exchanges in merger trades. How this plan is taking hold in the steel industry is seen in the exchange of preferred stock of the Trumbull Steel Co. for Republic Iron & Steel Co. common in the recent consolidation of those two companies. Where no such exchange is possible it sometimes is feasible to issue new common stock and retire some of the fixed preferred stocks or bonded indebtedness with the proceeds. This is particularly possible in a market eager for common stocks. These are financial considerations which indicate the trend of present merger thought.

In bringing a merger of companies together it is not sufficient merely to work out an exchange of securities that is satisfactory to all concerned. It is necessary to plan for the co-ordination and unification of physical plants and operations. After this is accomplished the all-impor-

(Concluded on Page 16)

When Is Merger Justified?

WHEN an exhaustive study of all factors lead competent persons to expect that the consolidation of a number of companies will result in avoiding duplication of effort, permit of reduction of producing and sales costs, and make possible greater economies all along the line, then a merger is economically justified. A merger of weak and unprofitable companies is likely to fail. Putting two or more bottles of red ink together does not make a black one.



Furniture and mechanical refrigerators are fields for steel consumption which did not exist ten years ago. Even the all-steel automobile body is of comparatively recent adoption

Creation of New Markets Is Aid to Present Selling Problem

Development of New Uses for Metal Products Rather than Struggle for Existing Markets Is Industry's Hope

By Robert T. Mason

IN TIME of excess capacity and low prices, it is disheartening for a producer to feel that the demand for his products is limited by the confines of his natural market. As a matter of fact, he is sorely tempted to go beyond the boundaries of his ordinary operations and seek business from competitors.

Many manufacturers indulge in this practice, but at best it is only an expedient. It may help fill the order books for a time, but it is done at the expense of some other manufacturer.

A more desirable procedure is to devote this effort to the creation of new markets. This may not be as productive of immediate results as the previously mentioned expedient, but it is constructive and not destructive in effect. Moreover the development of new uses of a product enlarges the scope of the market, minimizes the dependence upon existing stationary or declining outlets for consumption and is the best possible insurance against unexpected shifts in public favor which frequently wipe out the need of a product almost over night.

While the metalworking industries generally have not engaged in the promotion of new markets in the systematic manner employed in many other lines of business, nevertheless they have made noticeable progress. This has been due largely to the efforts of the Sheet Steel Trade Extension committee and the American Institute of Steel Construction. While their activities have been under way a comparatively short time, the results already are apparent.

Must Cultivate Markets

Market development is more than the mere application of a product to a new use. It embraces also the creation of favorable opinion for the article and the perfection of a suitable chain of distribution agencies to make it conveniently available to the purchasers.

This is well illustrated by the slow but steady progress made in introducing certain items of steel furniture. The first reaction of the public to these products was one of antagonism. The early pieces were not pleasing to the eye. The public preferred the unquestioned beauty of wood to the then crude imitations produced in metal. But the manufacturers persisted. They developed painted finishes and lithography for sheet steel and tin plate. Through their ability to offer sheet steel with finishes of all grades of wood, from oak to black walnut, and with lithography developed to three and four color processes, steel furniture manufacturers have overcome a serious handicap. The unsightly green filing cabinets, desks and tables produced by these manufacturers several years ago, have been replaced by attractive products in natural wood finishes matching in beauty the choicest woods. Radiator shields and covers now are manufactured with as much emphasis on blending the finished product with its ultimate surroundings as with the quality of steel and the mechanics of forming it. Metal trim, commonly employed in commercial buildings, through the use of artistic finishes now available, is made highly attractive as a material for the builder of residences. Metal trim, however, has but scratched the surface of its opportunities in residential application.

Proficiency in the decorative coating of sheet steel has led to many new applications such as steel ceilings. It also has given impetus to steel tile, a new product which promises to become a standard unit of

construction. It consists of sheet steel, either galvanized or special finish, to which is applied several coats of porcelain. In addition to having the marked advantage over ceramic tile of assurance against cracking, it is estimated that its final cost, including economies in setting, is 40 per cent below that of conventional wall tile. Again the ability of steel to take a finish of attractive color makes it a desirable material. The modern trend in bathroom and kitchen finish is toward color, and colored steel tile meets this requirement.

That proper realization of the possibilities of a market is important is demonstrated by the history of steel shelving. The manufacture of this commodity dates back more than a decade, yet it has been only in the last three years that producers have been aware of the full possibilities of their product. By designing the parts so that the shelving could be adapted to many uses, the market was broadened considerably. For instance, it was discovered that by inverting the standard sections of shelving, they became suitable for use as tire racks. This simple expedient made every garage and tire shop a possible purchaser of steel shelving.

Retailers' Co-operation Valuable

These manufacturers also have been far-sighted in enlisting the co-operation of the retailer in their program of distribution. The education of the ultimate user to the advantages of steel shelving has been a profitable item of their sales promotion work. Instead of maintaining a large stock of lumber, which must be sawed to size, possibly planed and then nailed, carpenters erecting shelving now can stock a few varieties of standard steel shelving which can be assembled into almost any desired size and shape by the use of a screwdriver and wrench. The ease of installation and the economies of smaller stocks have made steel shelving an attractive line for retailers to handle.

Shelving Output Increasing

The following figures of the department of commerce showing value of orders received for steel shelving, indicate the perceptible growth of this industry since its leaders became aware of its marketing possibilities:

Year	Value of orders
1920	$3,421,430
1921	1,473,909
1922	2,439,799
1923	4,372,286
1924	5,599,659
1925	6,950,216
1926	7,340,351
1927*	6,157,083

*For first 10 months.

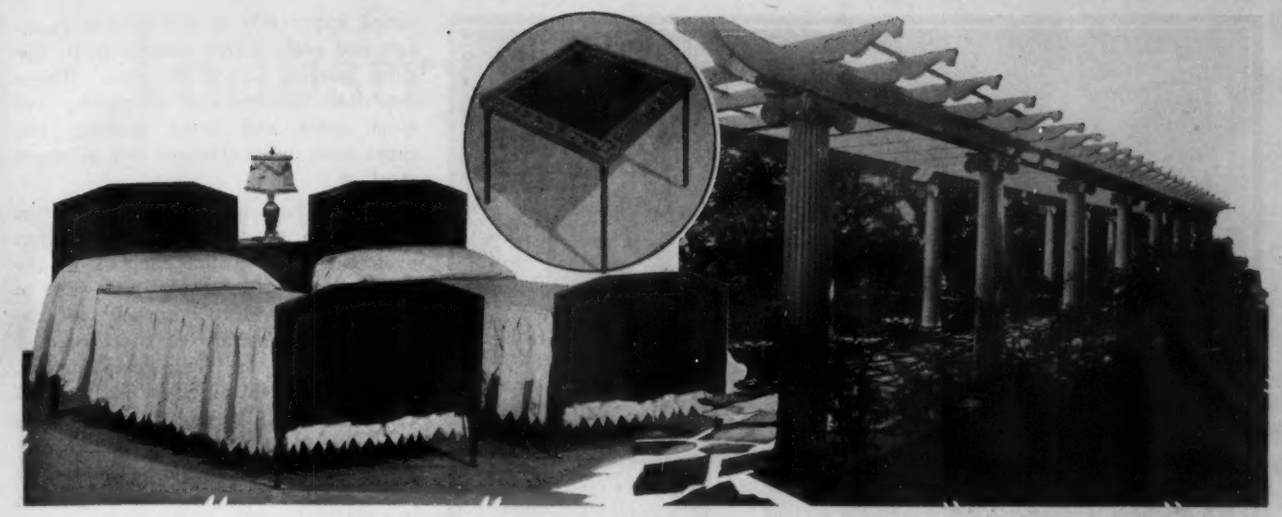
Although little steel is used in actual construction of radio sets, considerable tonnage is required for the machinery of production, broadcasting equipment, etc., and it is a significant fact that demands for steel products must have grown by necessity in the jump from 100,000 sets in use in 1922 to the 7,500,000 being operated in 1926. Much of this field has been monopolized by copper, brass, wood, rubber and other materials. In a few cases steel has entered the radio industry to replace other materials, such as the recently introduced steel cabinet. Again, in marketing, steel proved the magic word for emphasis, the new cabinet being introduced in advertising to dealers with the phrase, "Steel takes its place in radio." Metal cabinets, chassis, panels and kit parts are offered by this manufacturer.

The wider employment of steel products in the construction of residences is one of the greatest opportunities now open to the metalworking industries. It is estimated that the use of steel framing in 50 per cent of the houses constructed annually in the United States would add approximately 2,500,000 tons, or about 100 per cent, to the output of fabricated structural steel. It still is early to predict the outcome of the present intensive movement to introduce steel frames for small homes, but the numerous residences thus far erected indicate promising possibilities. The erection of a steel house on Long Island was attended by widespread publicity, not only in the newspapers but also through the medium of moving pictures. The interest, displayed by architects, engineers and contractors and the fact steel producers and fabricators of high standing are entering into contracts for the supplying of steel and its fabrication afford ample evidence of the seriousness with which the possibilities for steel frames for houses are being entertained at the present time.

Residence Opportunities Extensive

However, opportunities for a more general use of steel in residence construction are not limited to the frame. Already steel stairways, now firmly established as the proper equipment

This shows how an enterprising merchant is displaying the beauty of porcelain enameled steel tile for his customers



New markets are only potentialities until someone takes the initiative, as in introducing the all steel card table shown above. Steel beds now are in favor, and pressed steel columns are found in many places where beauty is an asset

for office buildings, are finding their way into apartments and dwellings. Steel window frames, once restricted to use below the first floor, now are being installed throughout new residences largely as artistic casement windows.

Development of the artistic in metalworking, sacrificed in recent decades to increasing production and obtaining large scale economic operations, has been revivified on a more extensive scale than ever. Ornamental and wrought iron ashstands, fireside and radio benches, door knockers, hinges, tables, lanterns, railings, etc., have found much wider demand in the past several years in harmony with the increasing interest in antiques. These products are not subject to large scale production and consequently do not aggregate a heavy tonnage.

Such work, however, as fencing, stairways, entrance rails, columns, entrances, balconies, gates, window casements, etc., involve a fair amount of iron and steel, and in the aggregate offer a lucrative field for the small structural and ornamental iron shops.

Roofing Field Needs Cultivation

Manufacturers of galvanized steel sheets have been endeavoring for years to build up a trade in roofing. Considerable progress has been made in the past year or two in roofing of agricultural buildings such as barns, grain cribs, elevators, etc. but numerous handicaps remain to be overcome before residential construction is swayed to their use. In the meantime, while the galvanized sheet interests have been lagging in their reformation of their product to incorporate the beautification necessary to successful sales, aluminum shingles have appeared and these have threatened to usurp the little hold that steel has obtained in the roofing trade. Lighter weight, greater insulation, reduced sweating, and other advantages are claimed for the aluminum shingle, giving the steel sheet additional sales resistance to overcome.

Steel has entered the kitchen of the home in a manner that promises to sweep all other materials before it. In years past, the only steel of consequence in the average kitchen consisted of the oven. A transformation in this product alone has been responsible for a greatly increased steel consumption. Less than a decade ago a stove factory was synonymous with a stove foundry. Today many stoves are manufactured almost entirely of pressed steel, only the burners and grids being of cast iron. The development of oven lining stock and the advancement made in enameling sheets have contributed to this change to steel.

Steel Refrigerators Gaining Favor

Probably the next largest opportunities for steel to enter the kitchen is in the form of kitchen cabinets and refrigerators. Although refrigerators have been used for many years and steel consumed in large quantities for interiors of boxes, it remained for the electrical refrigerator manufacturers, seeking mass production, to demonstrate to the steel industry that these boxes could be steel outside as well as inside. The facilities offered by steel for mass production of refrigerators is best demonstrated by one of the leading manufacturers, which after adopting the steel box, was able to step up its production line to 2000 units a day. The field of electrical refrigeration, as was the washing machine industry five or six years ago, still is in its infancy. The history of the American public, especially in the past decade, has been marked by the rapidity with which luxuries of one year become essentials of a few years later. It is this gradual rise of the standard of living that assures the manufacturers of washing machines, electrical refrigerators and other labor-saving de-

Small Items Account for Large Tonnages

SPECIFIC examples of the importance of insignificant products when grouped together as industries are being presented biweekly in the "Large Uses of Steel in Small Ways" series of IRON TRADE REVIEW. *To date,* 106 *of these articles have been published, dealing with small products ranging from the manufacture of swords, requiring* 16 *tons of steel annually, to the production of tin cans, taking about* 1,510,000 *tons of steel each year.*

In these 106 *articles described, approximately* 13 *per cent of the entire steel consumption of the United States is centered. Twenty-seven of these products require sheet steel, estimates for* 1926 *and* 1927 *production being about* 523,650 *tons per year. Twenty-two products require about* 89,710 *tons of wire per year and* 12 *products consume about* 1,185,100 *tons of steel bars annually.*

Residential construction offers large possibilities for the adaptation of steel products. Note the steel frame, steel window sash, steel ventilator and steel stairs

vices continued expanding markets for their products.

Steel was the material used originally for the production of washing machines but the steadily encroaching use of copper reduced the steel consumption considerably. Just recently washing machine manufacturers have started to swing back to the use of steel instead of copper for tubs. Dishwashing machines, as yet not developed beyond the luxury class for most people, have taken a step toward wider use of steel by replacing cast iron tubs with vitreous enameled pressed steel. A product just recently introduced that relies on steel for its material is the combination of table, wash tub and bath tub.

Household Appliances More Popular

The emancipation of the American woman from household drudgeries has contributed in no small degree to the marked growth of mechanical aids, either as cause or effect. The washing machine, vacuum cleaner, semiautomatic stove, kitchen cabinet, refrigerator, built-in ironing board, vitreous enameled table, and many other articles all now are actual markets for steel. But to realize the fullest possibilities of these newly developing fields, fabricators and distributors must pursue marketing methods sufficiently sound and aggressively organized to combat the highly developed competition of other material manufacturers.

Another marked trend in retailing of small items of merchandise is the development of the vending machine. Manufacturers of gum were among the first to recognize the potentialities of sales building through employment of the vending machine. Within the past year, many other manufacturers have turned to this medium for putting their products before the public in those places which have been proven to offer the greatest sales possibilities. It has been made possible to the American public to buy a wide assortment of articles from automatic vendors, including such items as combs, fruits, candies, gums, stamps, handkerchiefs, cigarets, etc. The only limitations placed upon this method of merchandising apparently is bulkiness of package and cost, which usually is in the coins ranging up to 50 cents. These machines incorporate a number of steel parts and more recently the cases have been stamped out of sheet steel.

The production of toys in America has grown to such proportions that even the most casual shopper in the Christmas season could not fail to observe the large number of articles made entirely of steel or embodying steel in their manufacture. Not only had steel been used to obtain structural strength, such as in toy automobiles, dump trucks, derricks, etc., but also for the ability of steel to take satisfactorily such finishes as would make them attractive to the eye. In the merchandising of their materials, a number of toy manufacturers have capitalized on the growing consciousness that products made of steel embody in their construction the best in material for fabrication.

More Sellers Extend Research

Selling steel in the past year has witnessed a further development of the mill-fabricator relation. Several of the larger producers have been concentrating upon the building up of groups of experts within their sales organizations whose duties lie largely in working out production problems with fabricators. The attempt is being made to correct the situation that has existed in the steel industry of waiting until fabricators demand better steels without anticipating these needs. Some companies are realizing that through research of their own they may originate new physical specifications and qualities of their steel, new products, and subsequently, new markets.

Within the next several weeks, programs for 1928 sales direction will be formulated and adopted by companies in the metalworking industries. In some cases, companies have made extensive investigations among their branch offices and field men seeking suggestions for improving sales during the new year. Sufficient emphasis has not been placed, however, on direct contact with the fabricator by the mills, with the wholesale distributor or jobber by the fabricator and manufacturer, and with the retailer by the jobber. To obtain the fullest realization of methods by which sales can be increased during 1928, a seller must develop the perspective of the consumer, must be thoroughly familiar with the problems that confront and perplex the user of his products.

Industry Advancing by Improving Labor Conditions

CLOSER association of capital and labor in manufacturing industries of the United States is the keynote of the present trend in employment relations. Co-operation is replacing conflict, resulting in benefits that otherwise could not be obtained. Time and experience are strengthening the doctrine of a mutuality of interest, breaking down class lines, and accomplishing an equitable distribution of wealth without disorder.

These conclusions as to a new unity of feeling and purpose between capital and labor are borne out by events in 1927. Wage rates were not reduced, though the lower rate of industrial activity might have seemed to warrant such action. Labor suffered relatively less than did capital, because high wage rates have come to be considered as fixed charges on industry, while the return on capital is contingent.

Average hourly earnings of industrial wage earners today are about 133 per cent higher than before the war, while the average yield of high-grade industrial securities is at or somewhat below the pre-war level. Wage earners are given first consideration. In contrast with the old order, it seems now to be the viewpoint of industrial managers that it is as important to keep wages up in slack periods of employment and production as when high activity favors such a course. This is evidence of a policy which it is believed promises security and stability.

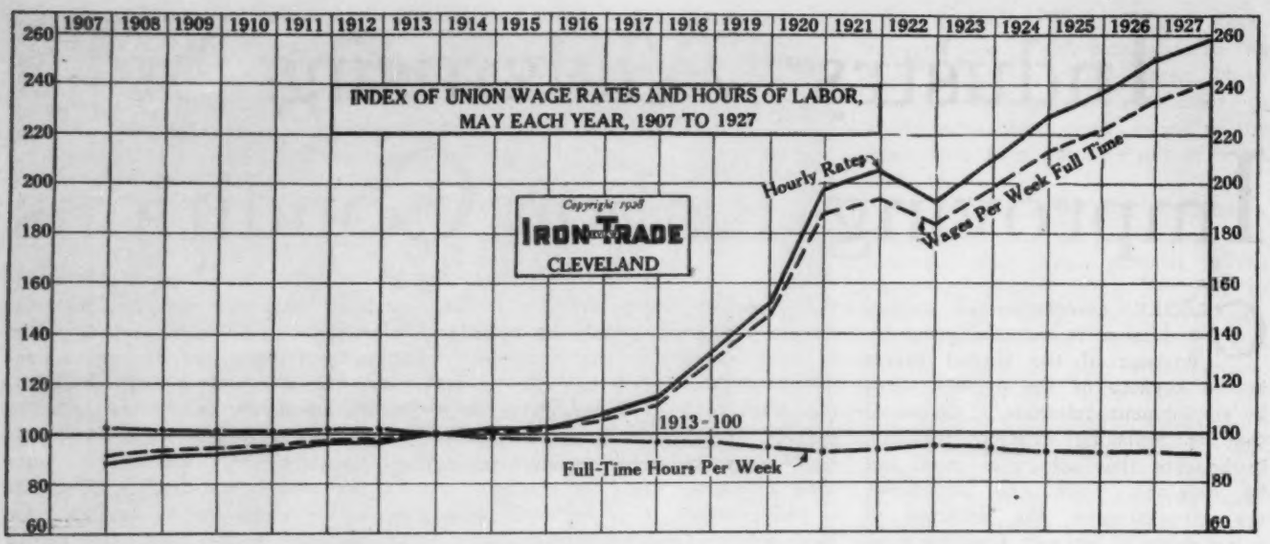
Wage earners have benefited by a long period of high wages and steady employment. How true this is is shown by data compiled by the bureau of labor statistics and the National Industrial Conference board. The bureau's figures are based on returns from about 10,000 establishments, employing more than 3,000,000 persons. The general index for payroll totals in 1927 was 93.2 or only 7.3 per cent below 1923. The 1927 index for employment was 89.2, or 12 per cent under 1923. Per capita earnings in November, 1927, were only 2.1 per cent lower than in November, 1926.

Wage earners as a group have en-

The president—
Never through!

The employes:
"Through for the day!"

When the whistle blows at 5 p. m.



joyed a practically unbroken period of unprecedented high wages and stable employment, with the result that the average weekly earnings of workers in industry today, in spite of higher living costs, have a purchasing power about 33 per cent greater than in 1914.

One result of this is seen in the tremendous growth of savings and investments. They now own, or are paying for, considerably more than $1,000,000,000 worth of securities of the companies for which they work, an average of $1250 per employe stockholder. This is shown by the records of 315 companies reporting to the conference board. About 800,000 or a little less than one-third of the total number of their 2,736,000 employers have a direct financial interest in their business. Many more millions have been invested by employes in companies other than those for which they work.

Group life insurance, in which the employer pays part or all of the premium, has grown rapidly so that the lives of about 4,700,000 employes are protected under this form of insurance for a total amount of $5,500,000,000.

The highest standard of living ever attained in the history of the world has been reached by the American people with a national income of $90,000,000,000, an increase of approximately 43 per cent in five years despite a reduction in average prices. The income per person gainfully employed is over $2000 per year, 140 per cent above 1914.

The number of labor disputes resulting in either strikes or lockouts was reduced considerably in 1927. In the first seven months of the year the number was 527, the lowest number of any like period since 1915, and nearly 2000 less than in the comparable period of 1917.

Coincident with this reduction in labor disputes further gains are recorded in the number of employes working under shop representation plans. Nearly 1,500,000 now are represented by councils through which they have a voice in their management and in solution of problems by which they are immediately affected.

Productivity Is Increasing

That co-operation between employes and management is being obtained in an ever increasing degree is evident in the gains recorded in the productivity of workers. Mechanization does not account for all the improvement in productivity; management is doing its share, in wiping out the gulf of distrust, suspicion and hostility.

Progress made in this direction is no more striking than in the steel industry, singularly free from labor discord; where wage rates have been maintained for years on a uniformly high level, where hours of labor and working conditions have improved.

The increase in output per man-hour in the iron and steel industry since 1914 is over 60 per cent. The industry today requires less than 80 persons, including all classes of employes, to produce as much as 100 produced 25 years ago, despite the shorter hours of labor. In all manufacturing industries an average of 67 workers produce as much as it required 100 to turn out at the beginning of the present century.

Recent data collected by one large steel interest showed the following gains over 1902 in the tonnage handled or produced, per man-hour in departments specified: Ore unloading 706.7 per cent increase; blast furnaces 277.3 per cent; bessemer ingots 99.8 per cent; open-hearth ingots 66 per cent; rail mills 120.1 per cent.

Automatic machinery has increased productivity in metalworking establishments at a ratio of 50 to 1 per worker in the past quarter century.

The level of employment in all manufacturing industries in November, 1927, was 6 per cent below November, 1926. Payroll totals were 8 per cent lower in November, 1927, than in November, 1926.

In the iron and steel group employment in November was 10.9 per cent below November, 1926. Payroll totals in the same group reflected the effect of decreased employment. The total in November, 1927, was 15 per cent below November, 1926. The iron and steel group includes eight divisions. For iron and steel manufacture the percentage of declines in employment and payroll totals were approximately those of the averages for the entire group. Following is a comparison of various divisions, based on index figures, with the monthly average of 1923 representing 100:

	Employment November		Payroll totals November	
	1926	1927	1926	1927
Iron and steel and their products	90.5	80.6	96.0	81.6
Iron and steel....	97.0	86.0	103.0	86.1
Cast-iron pipe.....	103.1	86.8	105.3	79.5
Structural iron-work	100.1	91.4	107.1	97.1
Foundry and machine-shop products	84.1	75.1	87.0	74.7
Hardware	85.8	78.9	97.1	84.7
Machine tools	104.2	90.3	117.2	99.8
Steam fittings	92.4	85.5	95.0	83.6
Stoves	91.6	80.2	97.4	80.2

Indicative of the general stability of wage rates in iron and steel manufacture, the United States Steel Corp.'s hourly rates have not been changed since 1923. In April of that year the rate was advanced from 36 to 40 cents, and in August of that year, when the 12-hour day was abol-

ished the rate for 10-hour shift men became 44 cents, and for 8-hour men, 50 cents.

Wages of union molders in the principal foundry districts are practically unchanged from a year ago. In the New York district weekly wages have been increased, equivalent to an advance from $8 to $8.50 for eight hours, while in Indianapolis wages were increased from $7.20 to $7.50 for eight hours. The general average for 11 foundry districts now figures out to 92.7 cents an hour compared with 93.6 cents at the postwar peak, and 43 cents an hour in 1914. Today molders receive for eight hours work approximately 115 per cent more than in 1914.

The scale of wages for puddlers was increased when a new contract for 1927-1928 was signed. The new scale like the former provides a base wage of $7 a ton when the average bar iron price is 1 cent per pound. However, wages now step up faster in relation to the bar iron price. For every 0.05-cent up to a 1.40c price the advance in wages is 22½ cents and for every 0.05-cent over 1.40c the wage advance is 25 cents.

The November-December 1927 rate for puddling was $11.30 on a selling price of 1.90c in the previous two months. Had the former scale remained in effect the wage would have been only $10.88. The increase in this instance is 3.7 per cent.

This wage of $11.30 is 8 cents under the wage in effect in the November-December period of 1926. It is 33 cents under the like period in 1925; 83 cents less than in the same period of 1924 and $1.83 less than 1923. It compares with $18.76 at the post-war peak of puddlers' wages, and an average of $5.60 for 1924. The bases of other wage rates on bar iron mills working under agreement with the Amalgamated Association of Iron, Steel and Tin Workers were not changed for the year 1927-1928. Neither were those for sheet and tin mill workers, except in certain minor instances. In respect to the latter the only practical method of making general comparisons is to indicate the wages in relation to the base, which has not changed in recent years. The wages in November-December 1927 were 28.5 per cent above base. In the comparable period in 1926 they were 33 per cent above base; in 1925 32.5 per cent above; 1924 39 per cent above, and in 1923 they were 48 per cent above base. At the war time peak they were 109.5 per cent above base. During some months in the midsummer slump in 1927 the wages were only 25.5 per cent above base. It was reported that the low selling prices of sheets tended to have such a depressing effect on mill wages that some makers for a time disregarded the scale and kept the wages up the same as though prices had held up.

Earnings Are Steady

Weekly earnings in shops represented by the National Metal Trades association have been fairly steady at a generally high average during the past year. In August 1927, the latest month for which the exact figures are available, the average was $27.16, or 40 cents more than in August 1926. It was 16 cents less, however, when compared with September, 1926.

The importance of these averages as reflecting wage earnings in metal trades manufacturing is indicated by the fact they apply to more than a half million workers. Employment in the National Metal Trades association shops generally inclined downward during the greater part of 1927. The total in October 1927, which was 559-423, represented a decrease of 8 per cent from 608,415 in October 1926. Gains in membership of the association were recorded during the year. Following is a month-to-month barometer of total employment in the shops and average weekly earnings:

	Employment	Average weekly earnings
Aug., 1926	636,031	$26.76
Sept.	634,780	27.38
Oct.	608,415	27.43
Nov.	583,485	27.14
Dec.	585,494	27.05
Jan., 1927	598,653	27.26
Feb.	615,179	27.68
March	622,503	27.53
April	613,979	27.39
May	591,353	27.52
June	568,283	27.32
July	573,860	26.82
Aug.	575,493	27.16
Sept.	564,484	.....
Oct.	559,423	.....

Union wage rates continued into 1927 the steady increase which has been uninterrupted during the past five years, according to the bureau of labor statistics. The survey covered most of the time-work trades in 66 important industrial cities and included more than 750,000 trade union workers.

The average hourly rate in 1927 for all the trades covered was $1.19 compared with $1.15 in 1926. This upward movement was reported general among the various organizations, but the amount of increase was not uniform and some trades suffered slight loss. Of the 73 time-work trades covered by the survey 64 obtained increased wages in 1927 compared with 1926, while the remaining nine showed slightly lower average rates in 1927 than in 1926.

In all trades, taken collectively, the

Typical of long service records in industry. Twenty-five men in general machine screw department of General Electric Co., Schenectady, N. Y., having total record of 758 years' continuous service, an average of more than 30 years each

average of hourly union wage rates was higher than in any preceding year, being 3.7 per cent higher than in 1926; 127.3 per cent higher than in 1917; 159.5 per cent higher than in 1913; 174.8 per cent higher than in 1910, and 189.2 per cent higher than in 1907. In other words, union wage rates per hour in 1927 were nearly three times as much as in 1910, and more than two and one-half times as much as in 1913.

Hours of Labor Reduced

Coincident with the rise in wage rates there was a further reduction in hours of labor, the average in 1927 being 45.2 hours per week. Because of the reductions in hours of labor the weekly rates have not increased to the same extent as hourly rates. Taken collectively, weekly wage rates in 1927 were 3.2 per cent higher than in 1926; 114.3 per cent higher than in 1917; 140.8 per cent higher than in 1913; 153 per cent higher than in 1910 and 163.1 per cent higher than in 1907.

In 1926 the regular hours of union labor were five-tenths of 1 per cent lower than in 1926; 6.1 per cent lower than in 1917; 7.7 per cent lower than in 1913; 8.7 per cent lower than in 1910 and 10 per cent lower than in 1907.

The average hourly wage rates in the building trades show the largest increase from 1926 to 1927. The average was stepped up 4.5 cents per hour, from $1.278 to $1.323. Following is the composite of union rates of wages per hour in the building trades, expressed by index numbers, 1913 representing 100:

	Index numbers		Index numbers
1913	100	1921	200
1914	102	1922	187
1915	103	1923	207
1916	106	1924	224
1917	113	1925	233
1918	126	1926	248
1919	145	1927	257
1920	197		

Corporation's Rates for Common Labor

	Wages for 10 hrs.	Per cent advance	Per cent advance over 1915
1915	$2.00	....	....
Feb. 1, 1916	2.20	10	10
May 1, 1916	2.50	13.6	25
Dec. 15, 1916	2.75	10	37.5
May 1, 1917	3.00	9	50
Oct. 1, 1917	3.30	10	65
Apr. 16, 1918	3.80	15	90
Aug. 1, 1918	4.20	10.5	110
†Oct. 1, 1918	4.62	10	131
†Feb. 1, 1920	5.06	10	153
†May 16, 1921	4.05	*20	102.5
July 16, 1921	3.70	*8.6	85
Aug. 29, 1921	3.00	*18.9	50
Sept. 1, 1922	3.60	20	80
Apr. 16, 1923	4.00	11	100
††Aug., 1923	4.40	10	120

*Reduction.
†Basic 8-hour day in effect; time and one-half for overtime.
††Twelve-hour day abolished. Labor placed on 8-hour shift paid at rate of 50 cents an hour.

Trend Is Toward Mergers

(*Concluded from Page* 8)

tant job is to find the proper management. No matter how well a merger is sketched out on paper, its success will depend upon its management and the ability of this management to carry forward the plans.

While indications in business today point toward mergers in many lines, they are not easy to bring about nor do they in all cases result in the success hoped for by the most optimistic. In the past few months dividends on the common stock of a number of mergers put together during the past year have been passed and for others earnings have not come up to the aggregate for the separate individual companies before the mergers. These examples do not constitute an indictment against the fundamental soundness of mergers, but they do indicate that industrial consolidations offer no panacea for the troubles of low profits and keen competition.

Economies Not Always Seen

The economies resulting from consolidations often are overestimated. Frequently it is possible to lump sales costs and sales effort, but because of the larger job at hand it rarely is possible to cut management and administration overhead in like proportion. In the case of two merged companies if this cost can be cut to one and one-fourth or one and one-half of the aggregate cost of the two companies before the merger then that is about all experience has shown can be accomplished.

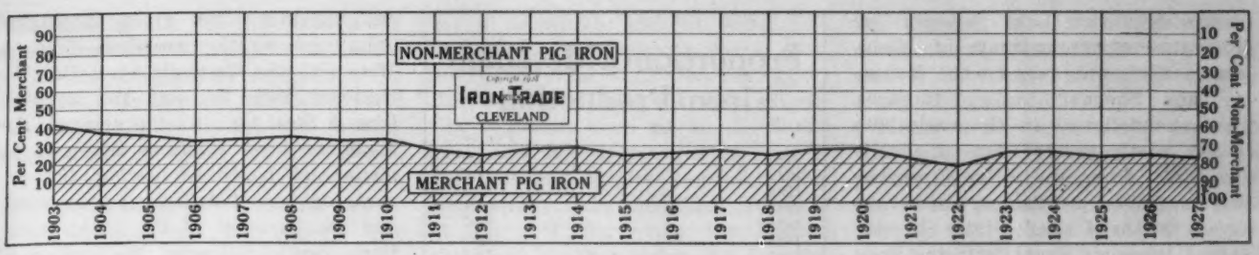
Unquestionably a process of natural economic selection is going on under present competitive conditions. The weaker and less effective marginal producers and distributors are suffering, while the larger and more efficient units are being favored. With larger units a greater spirit of cooperation ought to be possible, but this should take the form of a dogged determination to shun unprofitable volumes rather than of price agreement.

Mergers have a legal aspect as well as an economic one. The Sherman act prevents a consolidation beyond a certain point, and it is not helpful for those who may be concerned with mergers to know that that point has never been determined.

The great movement toward mergers early in the twentieth century was followed by an era of unprecedented industrial expansion and prosperity. It is not unlikely that the present trend toward greater and more efficient units will enable American enterprise to consolidate the gains it has already made and to eliminate much of the unsoundness in the competitive struggle. Thus industry will prepare itself for a new and even more amazing period of activity and prosperity in the years ahead.

Advance in Union Molders' Wages

	Rates, 1914	Postwar Peak	Rates Dec. 31, 1927
BOSTON:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.20 for 8 hours 131.9% over prewar
CHICAGO:	$4.00 for 9 hours	$8.40 for 8 hours 136.4% over prewar	$8.00 for 8 hours 125.2% over prewar
CINCINNATI:	$3.50 for 9 hours	$7.00 for 8 hours 125.5% over prewar	$7.50 for 8 hours 114.3% over prewar
DETROIT:	$3.50 for 9 hours	$8.50 for 8 hours 173.7% over prewar	$7.20 for 8 hours 131.9% over prewar
MINNEAPOLIS:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$6.16 for 8 hours 98.4% over prewar
NEW ORLEANS:	$3.25 for 9 hours	$7.20 for 8 hours 149.3% over prewar	$6.40 for 8 hours 97% over prewar
NEW YORK CITY:	$3.75 for 9 hours	$7.04 for 8 hours 111.5% over prewar	$8.50 for 8 hours 154.6% over prewar
PITTSBURGH:	$4.00 for 9 hours	$7.50 for 8 hours 111% over prewar	$8.10 for 8 hours 102.5% over prewar
ST. LOUIS:	$3.50 for 9 hours	$8.00 for 8 hours 157.7% over prewar	$7.50 for 8 hours 141.3% over prewar
CLEVELAND:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.60 for 8 hours 117% over perwar
INDIANAPOLIS:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.50 for 8 hours 130.7% over prewar



Merchant Blast Furnace Output Declines Steadily Over Long Series of Years

What Ails the Merchant Pig Iron Industry of America?

Decline from 42 to 23 Per Cent of Merchant Iron to Total in Quarter Century Shows Decadence of Industry—Hope for Future Lies in Economical Integration, Including Sources of Materials Consumed

By J. F. Froggett

THE phenomenal rise of the merchant blast furnace industry in the United States over a long series of years came in response to the ever growing domestic demand for pig iron. The magnitude of this American industry came to a climax with a rapidity of development paralleled in the history of no other iron-producing nation in the world.

Its decline in very recent years has raised the question in the minds of present ironmasters "What is to be the fate of the merchant pig iron producers?" A glance backward for the moment into the history of this once persuasive art of merchandising pig iron may disclose some of the seeds for its disintegration. Because it is disintegrating as surely as did the once highly important bar iron industry of this country, but in the last generation of ironmasters.

The early charcoal furnaces scattered throughout the East and, for some years in the early part of the last century, in the Middle West, largely worked "float" oxide iron ore found either as lean "kidney ore" in creek bottoms or as the equally lean "blackband" carbonate ore dug out of creek banks near the coal measures. For instance, the first blast furnace built west of the Allegheny mountains was a charcoal stack erected in 1808 on the banks of Yellow Creek in eastern Ohio near where stands the present stack of the Struthers Furnace Co., Struthers, O. It ran for years on charcoal made from wood chopped out of adjacent hardwood forests and the "kidney ore" picked up in the Yellow creek bottoms. These pioneer Vulcans not only produced pig iron at the rate of one or two tons daily but they also ran the metal into molds, making cast iron kettles, andirons and pone-cake bakers. Later the soft pigs were taken to Niles, O., and there hammered into fine merchantable bars.

Were one to apply the hair-splitting analytical methods of the present day in an effort to distinguish between the merchant and nonmerchant or steelworks furnaces of the American industry, to the stacks of that day, he would face much difficulty. Little of the early pig iron was sold as pig iron, but mostly the furnacemen themselves turned molders and cast their product into forms useful to the early pioneers, chiefly farmers.

Distinction Grows Dimmer

Today in blast furnace technology, a merchant stack is one that sells its product as pig iron in the open market to others who, either as foundrymen, puddle mill managers or steelworks operators, work that pig iron into other finished products for the market either as iron or steel. All other blast furnaces, whether built or acquired by rolling mill, foundry or steelworks interests are known as nonmerchant stacks, because primarily their pig iron goes directly into their companies' own cupolas, puddling furnaces, bessemer converters or open-hearths, and does not get to the open market as pig iron. Once a few years back, these distinctions were drawn carefully, because in those days most steelworks did not produce sufficient pig iron to supply their own needs. Hence, they were compelled to purchase vast tonnages of pig iron in the open market. Today, the distinction is not preserved so carefully, a stack being a merchant furnace in October, say, only to become a nonmerchant stack in November, depending upon the contingencies of the markets for pig iron or steel.

The blast furnace and rolling mill industries had long since been established firmly along the Atlantic seaboard, when only a few venturesome charcoal stacks began to be scattered in isolated cases and supplying an uncertain local trade in the wooded sections of western New York, western Pennsylvania and eastern Ohio. These were encouraged by the building of the Erie canal and the broadened use of the Ohio river as an avenue of internal transportation as the tide of immigration flowed westward strongly. More furnaces and little rolling mills sprang in out-of-the-way places, this especially being true after the Baltimore & Ohio and Pennsylvania railroads extended themselves to Chicago around 1868. Meanwhile in the once virgin Northwest territory vast quantities of soft coal were uncovered, and during Civil war days it was found possible to smelt iron ore with raw original Brier Hill splint or block coal, as actually was done at Youngstown, O., and Sharon, Pa. These thriving blast furnaces then were dependent at Youngstown, Ironton, Jackson county, O., Mercer, New Castle and Uniontown, Pa., upon the uncertain local supplies of kidney or blackband ores.

Yet another great event gave tremendous impetus to the pig iron industry of the Middle West. That was the opening shipment by water

of the first rich Lake Superior ore from the upper peninsula of Michigan in Civil war days to the Mahoning and Shenango valley furnaces. This was followed in the early 90's by the vastly greater flow of equally rich ores from the Mesabi regions that probably unwittingly had been saved to the United States by the patriot Benjamin Franklin in the Paris peace negotiations following the Revolutionary war. Had it not been for these three important events, the American pig iron industry might have been a comparatively small affair, or its development to present vast proportions might have remained a matter for the yet far distant future. The use of the then new Lake Superior ores in middle western blast furnaces led directly to the rise of the great Connellsville beehive coke industry which really began to date industrially from 1880.

Just as the imperative needs of Northern armies in the Civil war brought the American blast furnace and rolling mill industries to rapid development, so also in the aftermath of depression in the South, many departed from raising cotton to other lines of endeavor. Early in the 80's came the rise of the pig iron industry at Birmingham, Ala., with the mining of rich iron ore and adjacent coal there, paralleled by a similar development in Tennessee which lifted Chattanooga and Knoxville to somewhat similar industrial prominence. Georgia's supplies of iron ore were not sufficient to maintain her pig iron industry and only a few years ago she passed off the pig iron map with the dismantling of her remaining two blast furnaces. The same thing also happened with the state of Washington, and has occured in the Arkansas Ozarks, western Missouri and almost completely in Texas, once the possessor of three blast furnaces. But in Missouri the situation has changed of late years, with St. Louis blast furnaces turning to the use of Lake Superior ore, thus building a flourishing industry and a potential rival to Chicago pig iron.

Old Names Are Recalled

The rise of the merchant pig iron industry in the East in past years is coupled with the names of such ironmasters as Samuel Thomas, the Heckschers, the Paxtons, the Colemans, the Haldemans, the Kauffmans, the Brookes and the Grubbs. Similarly, the Virginia industry owed its former brilliancy to the efforts of such leaders as Samuel A. Crozer, J. W. Robinson, the Milnes and others. But these men built up largely a local market for their pig iron, although for many years many thousands of tons of Virginia iron were marketed in Philadelphia and New England alongside the product of eastern Pennsylvania and New Jersey stacks; but this was owing to prevailing water and rail freight rates which happened to favor the Virginia ironmasters. But the Great War days' revamping of freight rates did the trick for the Virginia furnaces, just as it shut out the Alabama furnaces from shipping their product to far away New England; although only a few years ago some thousands of tons of Alabama iron lay in store at Connecticut warehouses, something very unlikely to be seen again because of the present adverse freight rate structure. In fact, today it is difficult for them to ship pig iron north of the Ohio river.

The rise, culmination and decline of the American merchant pig iron industry in its broadest phases and involving its greatest tonnages, closely parallels the career of the veteran ironmaster J. G. Butler Jr. who died on the eve of his eighty-seventh birthday anniversary on Dec. 20, 1927, at his home at Youngstown, O. Indeed, he was one of the prime movers in the stupendous marketing of pig iron in the Mahoning and Shenango valleys a quarter of a century ago that led the merchant furnaces in the Middle West to the apex of their power and prosperity. Through his masterly marketing methods and his intimate knowledge of the industry's needs, these merchant furnaces were dragged out of their purely local influence and hurled into world prominence.

This came about when, during the era of vast industrial mergers in the period from 1899-1901, steelworks, mills and blast furnaces were being put together into great integrated units such as the American Steel & Wire Co., the Carnegie Steel Co., the National Tube Co. and the Republic Iron & Steel Co. As the demands for American steel products advanced by leaps and bounds following the advent of the "McKinley prosperity" and the bursting of the pent up national needs following the ending of the Spanish-American war in the autumn of 1898, the merchant pig iron industry reached its climax. The newly formed units could not make sufficient pig iron for their unparalleled and imperative requirements, and they turned to the nearby merchant furnaces to supply the deficiency. Then it was that Mr. Butler as the agent for the Bessemer Pig Iron association made his debut as pig iron salesman extraordinary. A quick trip to Pittsburgh, and he would dispose of 50,000, 80,000 or even 100,000 tons of bessemer pig iron to Charles M. Schwab, then president of the United States Steel Corp., to be delivered by the score of valley furnaces in the ensuing months. His remark to the waiting newspapermen at Youngstown following such a trip would be:

"Well, I did a good stroke of business at Pittsburgh yesterday—I sold 100,000 tons of pig iron to Charlie Schwab." The Associated Press wires quickly carried the news to the business world that the Youngstown pig iron industry was beginning to boom anew, restoring confidence to a discouraged trade, and incidentally bolstering up a wobbly steel billet market also. But one good turn deserved another in those days.

Shift Easily To Basic

When the bessemer steel rail went out of fashion with the railroads, as previously had gone the wrought iron rail, the valley furnaces turned just as readily to the production of basic pig iron for open hearth use. Again Mr. Butler would pack his grip and make a trip to Pittsburgh, this time selling basic iron in lots of 25,000 to 50,000 tons for the valley furnaces, but now to President William E. Corey to supply the Steel corporation's needs.

But as rapidly as possible, the larger steel units had been adding to their blast furnace capacity, building vastly larger stacks than formerly, and they bought less pig iron each year in the open market. The valleys then began to acquire their own steelworks at Youngstown, New Castle, Sharon and elsewhere, taking in many former merchant stacks. Those that remained outside turned to the production of foundry, forge and

Proportion of Merchant Iron Production

Year	Per cent merchant
1927	23.1
1926	24.7
1925	24.4
1924	26.7
1923	26.0
1922	19.5
1921	22.3
1920	29.0
1919	28.0
1918	25.3
1917	27.7
1916	26.9
1915	25.7
1914	29.2
1913	28.7
1912	25.1
1911	28.4
1910	33.6
1909	33.4

In 1903 the proportion of merchant pig iron to all pig iron produced that year was 42 per cent.

malleable irons. But the markets for these grades soon began to be limited by outside competition complicated by constantly advancing railroad freight rates that have divided the country into small, restricted pig iron zones. No longer was it possible for the small independent merchant furnace to send its iron long distances—it was just as if a stone wall were built around it a certain number of miles away in every direction. The Ohio river open to Cincinnati and Louisville, Ky., kept the last Ironton, O., merchant stacks several years longer in operation.

Buyers Turn Competitors

Then a dozen years ago in times of business depression when the merchant furnaces could least withstand it, came another blow. This was the appearance of the steelworks furnaces in the open market as sellers of basic pig iron, then later foundry and malleable, their surplus after their own needs were satisfied. First at Pittsburgh, then at Chicago, later at Youngstown and again at Buffalo, these sales by former nonmerchant furnaces cut the ground out from under the strictly merchant furnaces, first because they could produce pig iron cheaper than the merchant stacks which had neither iron ore affiliations, their own transportation facilities, their own coal and coke properties nor a potentially assured outlet. So at Buffalo within recent years, some merchant furnaces such as the Rogers Brown Iron Co. sold out their properties to others such as M. A. Hanna Co. which are determined to stay in the industry despite new and keen competition from merchant furnaces at Troy, N. Y., along the Hudson river and at Boston for the once lucrative New England foundry trade. Or others sold their stacks to foundry interests such as the Tonawanda furnaces to the American Radiator Co. Still others, such as the Columbia Steel Corp. built at Provo, Utah, a modern blast furnace which now is furnishing pig iron produced from Rocky mountain iron ore and coal by means of by-product coke ovens, to the entire Pacific coast trade. And this trade once got its pig iron, mostly until a few years ago, from British furnaces, the pig iron being carried cheaply as ballast in ships bound for the coast to get return cargoes of canned salmon and lumber for the British Isles. Additionally, it got thousands of tons of Alabama pig iron that often carried a railroad freight rate of $10 a ton to its Pacific coast destination, equal to the furnace price of the pig iron. A partial offset to this situation in the South now is being found in the shipment of Alabama pig iron to the Pacific coast cities via ovean vessel through the Panama canal; but such trade is necessarily limited as to volume, and it is volume of pig iron sales today that counts.

Hence it has come about logically that whereas the annual per capita production of pig iron in the United States has leaped from 171 pounds in 1880 to 327 pounds in 1890, to 406 pounds in 1900, to 663 pounds in 1910, to 777 pounds in 1920, and sank to 690 pounds in 1927, yet the proportion of this vast flow of iron by the strictly merchant furnaces has not kept pace. This is evidenced clearly by the graph which appears at the caption of this article. Back in 1903, the merchant furnace production of pig iron was something like 42 per cent of all pig iron produced that year. But as one will see from the accompanying table, the proportion of merchant pig iron to all pig iron has decreased steadily until in 1927 it has reached the low percentage of 23.1 per cent.

Furnace Capacity Soars

Meanwhile the productive capacity of such stacks as continue actively in the business of producing pig iron in the United States, this including steelworks as well as merchant blast furnaces which employ coke as fuel, has leaped violently upward, for instance, since the "boom days" of

(*Continued on Page* 23)

Zenith Furnace Co.'s Plant at Duluth, Now Being Modernized, Is Example of Fully Integrated Blast Furnace Plant

1927 Diary of American Industry

January	JAN. 1.—Judge E. H. Gary, Charles M. Schwab and others predict good year. 3—American Bridge Co. awarded 23,000 tons of shapes for New York subways. 5—Reported European railmakers will keep hands off American market. 10—Pig iron producers at Birmingham cut $2, to $18, and sell over 100,000 tons. 13—Mahoning valley sheet mills reported considering merger. 15—Competition in heavy finished steel becomes keener; plates and shapes at Pittsburgh drop to 1.90c. 21—Connellsville coke operators cut wages to 1922 scale, or $6. 24—James A. Campbell discusses bank direction of steel companies at Cleveland dinner. 29—Secretary Mellon signs report on dumping of German pig iron.	*E. H. Gary and C. M. Schwab optimistic*
February	FEB. 1.—Bessemer iron reduced 50 cents in Mahoning valley with basic following suit. 2—Tariff commission urges President to increase pig iron duty 50 per cent, to $1.12½. 4—No. 2 foundry in Valley drops to $18, with basic offered at $17.50. 10—Unfilled orders of Steel corporation drop after four consecutive advances. 12—German offerings of wire in East increase. 14—Plates are weaker at Pittsburgh, selling at 1.80c. Parley between bitumnious coal operators and United States Workers opens at Miami, Fla. 15—Carnegie Steel Co. begins selling new Carnegie beam sections. 22—Bituminous coal wage parley breaks up. 23—Chevrolet Motor Co. production in January 73,000 units against 70,000 for Ford.	*Chevrolet production beats Ford's*
March	MARCH 1.—Producers at Cleveland raise pig iron 50c, to $19.50. Proposed consolidation of independent Mahoning Valley sheet mills is declared off. 5—Pig iron advanced another 50c at Cleveland. 7—Pittsburgh district makers announce differential of $2 on small lots of heavy finished products. 8—Navy department calls for bids, April 5, on six scout cruisers requiring 42,000 tons of steel. Ford Motor Co. inquiry for 400,000 tons of iron ore opens 1927 lake ore season. 10—Decline in Ford production stirs speculation over new model. 12—Bolt, nut makers issue new lists. 14—Steel corporation report shows 1926 best peace year. 16—Interstate commerce commission rate probe opens at Pittsburgh.	*Steel corporation announces 1926 earnings highest in peacetime*
April	APRIL 1.—Union bituminous coal miners strike. Joshua A. Hatfield is elected president of American Bridge Co. 7—**March steel ingot production sets record high for all time.** 8—Lake Superior iron ore prices reaffirmed. Union coal mines announce intention of reopening on nonunion basis. 11—Connellsville coke prices decline 10 to 25c despite coal strike. Eaton interests of Cleveland buy large stock interest in Republic Iron & Steel Co. 16—Navigation on Great Lakes is officially opened. 26—Harry Coulby and H. G. Dalton are put on board of Youngstown Sheet & Tube Co. Charles A. Fisher is elected president of Jones & Laughlin Steel Corp. 27—Youngstown Sheet & Tube Co. takes lead in increasing sheets.	*March steel ingot output sets new high record.*
May	MAY 1.—Coal strike is month old, with coke 50 cents lower. 9—Basic and bessemer iron are off 50c in Mahoning Valley. 12—New York Central railroad places 3674 freight cars and 60 locomotives. 16—Organization of Hot Rolled Strip and Cold Rolled Strip Steel institutes is complete. Wire nails, barbed wire and staples at Pittsburgh are cut $1. 23—Hamilton Coke & Iron Co., in which American Rolling Mill Co. has half interest, takes over Hamilton Furnace Co. 25—**Henry Ford officially abandons Model T and announces plans are under way for new low-priced car.** 30—New pig iron freight rates are made effective in Central Freight territory. 31—Tin and sheet mill wage scales reaffirmed for year.	*Ford officially abandons Model T*
June	JUNE 1.—British makers of ferromanganese announce $90 price for last half after domestic makers had booked most business at $95. S. G. Garraway Co., Chicago, takes over Thomas Furnace Co., Milwaukee, and forms Milwaukee Blast Furnace Co. 4—Dr. John Johnston is made head of Steel corporation's new bureau of research and technology. 6—Weakness in beehive coke is checked, bottom being reached at $2.65 for furnace. 7—Tariff commission orders investigation of manganese ore situation. 9—Universal Portland Cement Co. opens new harbor at Buffington, Ind. 14—Secretary Mellon finds no dumping of German rails. 15—Rivet makers announce $5 advance. 28—Clinton stack at Pittsburgh sold.	*Steel corporation announces Dr. John Johnston as head of research*

Discloses a Year of Contrasts

American Rolling Mill Co. buys Columbia Steel Co.	JULY 1.—Jones & Laughlin Steel Corp. inaugurates steel ferry service on rivers at Pittsburgh. 5—Pig iron production figures for June show 14 steelworks stacks out. 16—Puddlers win 42c per ton advance in settlement for year ended July 1, 1928. **19—American Rolling Mill Co. buys Columbia Steel Co.** Walter C. Carroll, vice president, Inland Steel Co., accepts presidency of National Sheet and Tin Plate Manufacturers and chairmanship of Sheet Steel Trade Extension committee. 27—R. E. Emery resigns as president of Superior Steel Corp. 28—Federal trade commission begins investigation of purchase of 114,000 shares of common stock of the Steel corporation by Du Pont interests.	***July***
Judge E. H. Gary dies	AUG. 1.—Pig iron is off 50c at Chicago, St. Louis and in eastern Pennsylvania. 2—Laclede Steel Co. buys Southern States Steel Co., Dallas, Tex. 9—Creditors committee takes over Belfont Steel & Wire Co., Ironton, O. **15—Judge E. H. Gary, chairman of the Steel corporation, dies in New York.** 16—Fourth anniversary of inauguration of 8-hour day in steel industry finds short day accepted as fixture. 19—Industrial Works, Bay City, Mich., and Brown Hoist Machinery Co., Cleveland, merge into Industrial Brownhoist Corp. 22—Lloyd Heckscher quits as president of Alan Wood Iron & Steel Co. 30—Customs bureau of treasury department finds no dumping of foreign spar.	***August***
Steel corporation announces advance in finished steel prices	SEPT. 1.—Canadian Steel & Wire Co., Steel corporation subsidiary, is to be moved to Ojibway, Ont., and enlarged. 10—Ward B. Perley is made president of Canadian Steel Corp. Ltd. 15—Steel corporation announces heavy finished steel price of 1.75c, Pittsburgh, and 1.85c, Chicago. 19—Cold rolled strip quantity differentials are revised. 20—Receivers are named for Rogers-Brown Iron Co., Buffalo. 23—Hot strip makers adopt quantity discounts. 26—Pennsylvania railroad distributes record purchase of 300,000 tons of rails. Bethlehem Steel Co. discloses introduction of 49 new structural sections. 27—Sheet prices decline $2. 29—Samuel B. Sheldon is made president of Minnesota Steel Co.	***September***
C. M. Schwab elected president American Iron and Steel institute	OCT. 4.—M. A. Hanna Co. buys Rogers-Brown Iron Co., Buffalo. 6—John Stambaugh Sr. dies at Youngstown, O. 10—Unfilled orders of Steel corporation show first decline since May. 12—Gary, Ind., celebrates twenty-first anniversary of its founding. 15—Cold finished bar makers issue new extras, following revised extras on hot rolled hexagons. 18—Six northern Ohio sheet mills agree to appraisal looking toward merger. 24—Receivers are named for Wickwire-Spencer Steel Corp. 25—H. C. Thomas is made president of Alan Wood Iron & Steel Co. **27—Charles M. Schwab presides at American Iron and Steel Institute meeting following election day previous by directors;** James A. Farrell, new vice president.	***October***
Steel producers raise prices of plates, shapes and bars	NOV. 1.—Amalgamated sheet and tin mill wage scale is advanced 3 per cent for November-December while puddling rate drops. 5—Federal court orders Eastern Steel Co. sold. 7—Steel pipe awards, exceeding 200,000 tons, set new high mark. 8—Manning, Maxwell & Moore announce organization of two new operating companies—Shaw Crane-Putnam Machine Co. and Consolidated-Ashcroft-Hancock Co. 11—Steel producers raise plates, shapes and bars $1 at Pittsburgh and Chicago. 12—President increases duty on magnesite 50 per cent. 15—Bolt, Nut and Rivet Manufacturers' association announces new list of sizes of manufacturers standard nuts. 27—Republic Iron & Steel Co. buys Trumbull Steel Co.	***November***
Iron and steel situation shows definite signs of improvement	DEC. 1.—First quarter pig iron buying movement starts. 2—New Ford shown. Secretary Hoover predicts good times will stay. 8—Bethlehem Steel Co. makes Coatesville, Sparrows Point, Lackawanna and Bethlehem heavy steel basing points. 17—W. P. Palmer, president, American Steel & Wire Co., dies. 20—Joseph G. Butler Jr. dies. 27—J. P. Morgan made chairman of Steel corporation; Myron C. Taylor chairman of finance committee; James A. Farrel continued as president, made chief executive officer. 28—Car buying best in three years. 29—J. S. Keefe made president of American Steel & Wire Co. Six independent Mahoning valley sheet mills merge as Empire Steel Corp.	***December***

Single Price on Heavy Steel Emerges from Brisk Market

Small Users Benefit from New Standard, which Drops Preference—Sales Policies Overhauled

By E. C. Barringer

HEAVY finished steel prices no longer lead a double life! Out of the crucible of 1927, in which merchandising policies of producers have been subjected to the scorching blast of a buyers' market, have come many refinements but none more comprehensive in its effect upon producers and consumers alike.

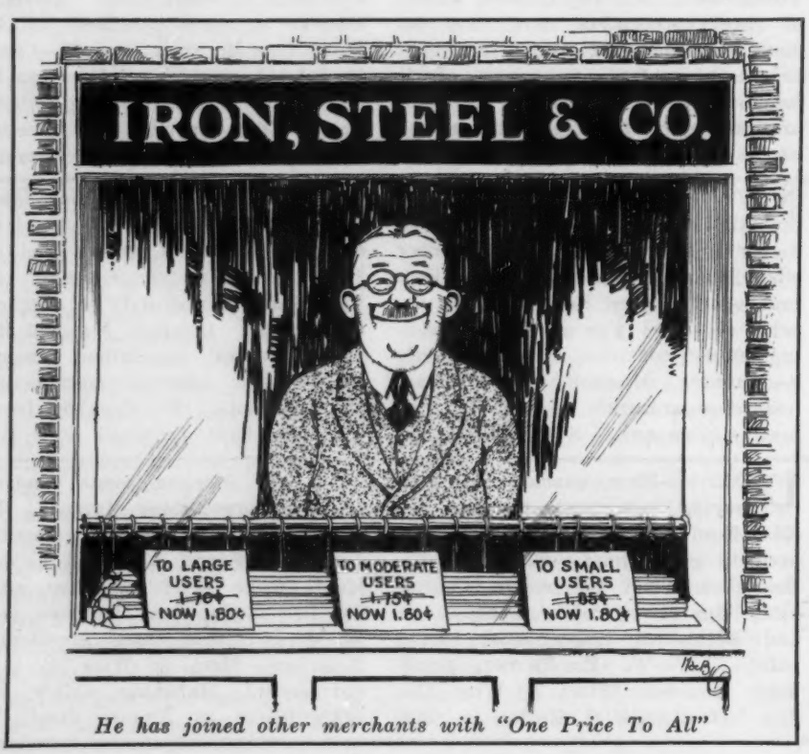
To move their products was of utmost concern to makers of iron and steel in all but the concluding weeks of the year. Viewed in the aggregate, demand was good, but the hand-to-mouth buying habits of consumers magnified the worries of sales executives from quarterly to weekly ones.

Reduced prices were primary and obvious expedients to attract business. The more enterprising of producers devised broader outlets for their wares. New routes of trade, chiefly by water, were charted to make delivered prices more alluring. Sales forces never before were so assiduous in cultivating customers. But tonnage was slow and difficult to conjure up. Like a person facing an ordeal whose outcome is uncertain, there was much self-examination. Sales policies were weighed and tested. Through this searching new light was cast upon practices, but none was more penetrating than the conviction that producers in the matter of price must cease to be all things to all consumers. Forthwith the double—sometimes triple—price standard for heavy-finished steel was jettisoned and, with minor reservations, one price was made to all buyers. To the general run of consumers it was consequential that this single price should approximate the then tonnage price. To most producers it was welcome riddance of an incubus of many years' growth.

In price as in quality, steel has not always been steel. Freight car builders, for example, have capitalized the size and attractiveness of their specifications—attractive because relatively little roll changing was involved—and have been commanding a differential under the so-called open market on plates. Tank builders have been putting much the same dress on their specifications for plates. The larger structural steel fabricating shops have likewise favorably appraised their requirements for plain material. Farm implement manufacturers have, in the past, received preferential treatment from the bar mills.

The result has been a price structure of two or three stories on steel plates, shapes and bars, with the tonnage buyer occupying the attractive suite on the ground floor and the small consumer climbing to the unfinished room in the attic. It was not so much that the smaller user was penalized as that the larger one exacted preference. Contrary to the single price standard in almost all business—in almost all branches of the iron and steel industry, in fact—this multi-price practice prevailed until the summer of 1927. Economic pressure forced the new standard; a recovery in the markets in the latter weeks of the year fortified producers in their new stand.

Roll-changing has been most frequently advanced as the primary reason for assessing the small buyer several dollars more per ton than the large one. It was contended that to roll one specification for 1000 tons of plates involved a smaller per-ton mill cost than to work off 10 different specifications for 100 tons each. Never was there more complaint than last year from the mills concerning the high cost of rolling small orders; never were the mills more indefatigable than last year in booking these very orders. And at the peak of their distress they aban-



He has joined other merchants with "One Price To All"

doned what was in effect an extra for this burden.

In the principal markets the concession to tonnage buyers has been $2 to $3 per ton. On a 2.00c market for plates, shapes and bars, tonnage buyers in the past expected to be quoted 1.90c or 1.85c, the differential ranging from 5 to 7 per cent. In a broad way, excepting only tin plate, no other iron and steel product has developed an "inside" price involving so great a discount.

Blast furnaces frequently cut under the market to build up a backlog but rarely is the differential on pig iron in excess of 2 per cent. In a recent notable instance, Mahoning valley furnaces shaded the market 25 cents on a quotation of $17.50, but this lower level shortly became the open market price. A contract for pig iron is a contract, and almost without exception a price is also a price. Tonnage buyers of iron and steel scrap command the lower figure of a spread, but the gap is rarely greater than 50 cents and does not represent more than 2 or 3 per cent of the delivered price. Sheets almost invariably are on a single price standard, as concessions developed by large consumers are soon broadcast and insisted upon by other consumers.

Tin plate also reformed in 1927 and eliminated the fiction from its prices. The open market quotation of $5.50 per base box, Pittsburgh, became largely nominal as buyers of any size and persuasive power won concessions up to 25 cents, and even more. In announcing a price of $5.25 for the first half of 1928 the mills gave open effect to this shading and declared that, save for the very large buyers, this was their one and only price. They conceded that their return from a fixed $5.25 level would be approximately the same as from the fictitious $5.50 quotation of 1927.

To many consumers of heavy finished steel a double or triple price standard has been reminiscent of the old days in retail store merchandising. Then the price ticket bore a code, a sale was a negotiation and the ability to bargain was commensurately rewarded. Now it is the exception when the price frankly and openly marked on merchandise is not rigidly adhered to.

By the way of near-relatives to the multi-price standard are the extra lists of the mills. Extras apply in a large percentage of transactions, but few buyers have ever attempted to solve their mysteries. Extra lists have not confused but they have beclouded the net delivered price to the buyer, which is what counts.

In few other ramifications of business are there such complications. When a finisher of steel takes prices on a 10-inch bar mill he is quoted a net, delivered figure at his works; he is not informed than an 8-inch mill is base, its price is so much, and an extra over this base will apply on the 10-inch mill. When an automobile is set on a showroom floor it is given a fixed, delivered price; the salesman does not thumb through his manual, apprise the prospective buyer that the base price on a 110-inch wheelbase model is so many dollars and that the car in question being a 120-inch one, an extra for length, as well as one for finish, must be added. The shoe department of any large store in New York or Chicago stocks as many sizes and styles of shoes as the average mill makes of bars, but no one size or style is taken as base and no extras or discounts must be figured for size, style or quantity. Each shoe is definitely priced, and the father of five children pays the same unit price for outfitting his family as does the father of one. The extreme in the iron and steel industry in figuring delivered prices is represented by boiler tubes, where as many as seven 5 per cent discounts surmount a basic discount from a list.

Concessions in heavy finished steel prices developed shortly after the turn of 1927. Major efforts were first centered on tempting business from large consumers and to the extent that sufficient tonnage was brought out to make March the greatest steel producing month in history, these efforts were successful. But shortly demand from large consumers sloughed off and the small buyer assumed relatively greater importance in the eyes of producers. By mid-summer it was the case in almost all districts that large and small consumers alike were on the same price basis, for the first time in the experience of many sales executives in an open market.

The situation was brought out into the open in September when Steel corporation subsidiaries, followed by independent producers, announced a flat price of 1.75c, Pittsburgh, and 1.85c, Chicago, on plates, shapes and bars. These levels, it was announced, applied to all buyers, with a single minor exception. Tonnage and small users were on the same basis on mill books. Sales managers developed acute myopia and became unable to distinguish Brobdingnags from Lilliputians.

The reservation referred to was a differential of $2 per ton on extremely small orders, which normally should be filled from warehouse. The purpose was to protect the small, legitimate mill buyer from the burden of helping carry warehouse transactions but the differential was difficult to enforce, as in previous efforts. At various times in the year quantity extras were announced on cold-rolled strip and cold-finished and hot-rolled steel bars, but they also were designed to safeguard the single price from the inroads of attenuated purchases.

Many of the market manifestations of 1927 have been peculiar to the buyers' market. If 1928 proves as active as the crystal gazers foresee, a sellers' year is a possible development. What then? It is logical to believe that the mills are basically glad to be on a single price basis, as much so as the small buyers, and that with tonnage flowing more freely they can the more easily turn aside arguments for preferential treatment. A higher market for all users rather than a return to the checkered price structure of the past is more in prospect.

Water Movement Gains

ASIDE from the single price basis, the most marked departure in 1927 *in merchandising iron and steel matured in water transportation.*

Between 30,000 *and* 35,000 *tons of pig iron was shipped from Cleveland and Buffalo to Chicago and Milwaukee, mostly in self-unloading steamers. The movement was small, considering the Chicago district's melt, but it revealed possibilities. Although the first shipment was not made till fall, over* 20,000 *tons of steel scrap was sent from Detroit to Cleveland.*

Semifinished steel was transported from Detroit to Lake Erie ports, and sheets taken back. Finished material from Buffalo to Duluth balanced downbound scrap. Detroit drew much steel by water, including alloy steel from Chicago and Buffalo. Bethlehem Steel Co. bought a steamship line to serve the Pacific coast. Relatively more steel was barged on inland waters.

What Ails the Merchant Pig Iron Industry?

(*Continued from Page* 19)

1907. At the top of the "boom" of that year in June, the 341 stacks of the country produced per stack an average of 6561.3 tons of pig iron monthly. At the top of the "boom" of 1909, in December of that year,

the 314 active stacks produced at the rate of 8543.6 tons monthly per stack. In the bottom of the 1919 slump in May, the 197 stacks blowing averaged 10,699.1 tons per stack monthly; in the bottom of the 1921 slump in July, the 69 stacks active produced 12,531.0 tons monthly per stack. By the time the 1925 slump came along in July, the 188 stacks then blowing produced an average of 14,176.9 tons per stack monthly, or over twice what they were producing per stack in 1907. In May, 1926, the 229 stacks active reached the high average monthly production of 15,186.9 tons per stack monthly; and in May, 1927, the 211 stacks active actually produced an average of 16,071.4 tons per stack monthly. The average stack production in November, 1927, if extended to 31 days for the 171 stacks then blowing would have produced at the rate of 16,085.1 tons per stack monthly.

The day of the big productive stack is definitely here, for the merchant as well as for the steelworks interests.

War Brought Maximum

The greatest number of active blast furnaces in this country that ever was available for producing pig iron since the IRON TRADE REVIEW began compiling blast furnace statistics reached the maximum in the war month of August, 1918, with a total of 438 stacks, of which 371 were blowing. Since that memorable month and up to and including December, 1927, a total of 83 stacks has been removed from the list through dismantling. Out of that total of dismantled stacks 68 are, or were merchant stacks, while only 35 nonmerchant stacks have been removed from that list. Only 2 new merchant stacks have been added to that list in all those years, while 17 new nonmerchant stacks have appeared on the list. In other words, the merchant furnace list lost 68 stacks and added 2, making a net loss of 66 merchant stacks since August, 1918; while 35 nonmerchant stacks went off the list, but 17 new ones were added, making the net nonmerchant stack loss only 18. Or a total loss for both classes of blast furnaces since August, 1918, of 84.

The almost prohibitive cost of building and equipping a modern blast furnace alone in selected locations in the Middle West which would hold commanding position in pig iron market strategy, suggests why few such stacks have been built in recent years. Back in 1911 one such stack erected in the Cleveland district cost $1,250,000, this having an initial output of 500 tons of pig iron daily. But war prices changed this fundamentally, and a new modern stack of about that size actually cost around $5,000,000 when thoroughly equipped. Add to these figures the expense of building a 54-oven by-product coke plant with all the necessary distillate and gas appurtenances which today is about $1,500,000. This gives a total of $6,000,000 to $6,500,000 for the cost of building a modern 500 to 750-ton blast furnace, figuring in the cost of the site, the railroad trackage, and putting in a pig-casting machine as a standoff with the steelworks' ladle system.

Present Return Inadequate

If one allows additionally for acquisition of Lake Superior iron ore lands or leases and West Virginia or Kentucky coal lands or leases suitable and adequate for supplying such a plant over a series of years long enough to amortize the original investment, one can use his own pleasure in calculating how many additional millions of dollars can be invested in this manner in blast furnace adjuncts. If the stack elects to buy its iron ore in the open market, the least it likely would pay is $4.50 a ton for suitable mixtures of ores, or $9 a ton of iron for ore at lower lake docks. Also must figured in the cost of limestone and coal upon which stiff railroad rates per ton from mine to furnace must be paid, including also the rate on ore from dock to furnace. Further, there come in salaries, wages, cost of supplies, etc., in addition to the annual cost of carrying the original investment which figures out about $400,000 for a 6 per cent charge. And in the face of all this, one finds the market price of foundry pig iron today is $17.25 to $17.50, furnace, an entirely inadequate return.

Again the question: "What will be the fate of the merchant pig iron producers?" It would appear from the foregoing narration of facts and figures the following deductions are permissible:

First. Those merchant furnaces which remain active in business and properous will supply pig iron to local clienteles since both rail and water freight rates like stone walls will define their marketing boundaries. There will be little "wild" competition among merchant stacks. In other words, they will be located in isolated localities, in districts where steelworks will not be tempted to sell their surplus pig iron at inconvenient times and at cut prices, as the merchant stacks view them.

Second. They will be built in close proximity to and closest business connection with by-product coke ovens, including also of course a municipal outlet at remunerative rates for their oven gas beside longtime contracts for the sale of their other coke oven by-products. Whether for the time being they must own their own sources of soft coal supplies depends upon how the bituminous coal industry works out of its present plight. As the matter stands today, they can actually buy suitable coal cheaper than they can mine it if they own the mining properties. This by-product coke feature clips off from $2 to $4 a ton on furnace costs of producing pig iron.

Third. They must either own their own Lake Superior ore or, if on the seaboard, their own foreign iron ore sources of supplies to be assured of cheaply mined ore over a series of years. Or, they must have closely associated iron ore affiliations, with adequate vessel facilities. Such vessels also can be employed to transport pig iron over the Great Lakes as Bethlehem, Corrigan-McKinney Steel and others have done in the past year.

Fourth. They will have far larger producing stacks than 10 years ago, some of the present-day merchant stacks having capacities of 900 to almost 1000 tons of pig iron daily. This reduces the per ton cost of pig iron through finer division of the overhead, etc.

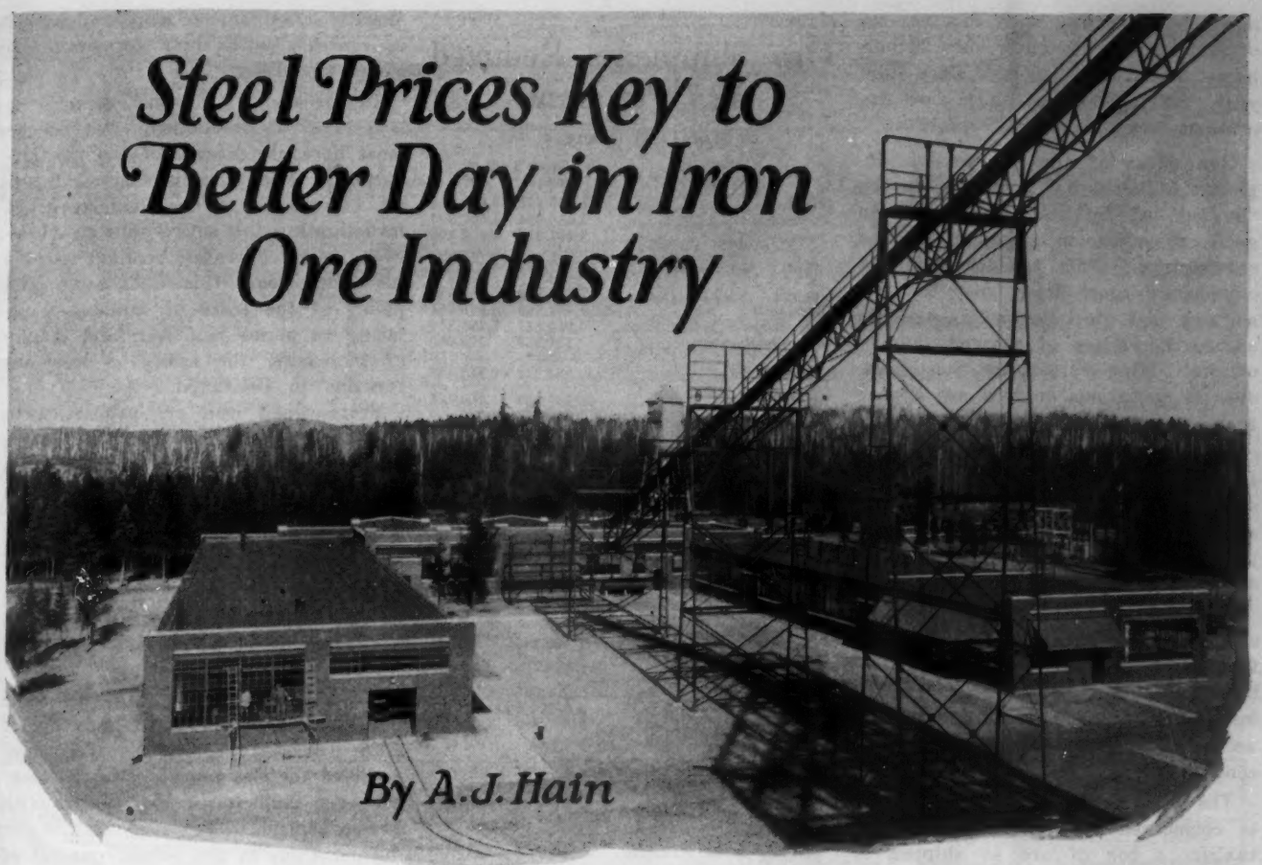
Fifth. They will have installed facilities for nodulizing or sintering their own ore and coke dust blown out through the downcomer of every stack through the use of the greater and faster air volume purposely pushing the stacks to greater output per day per stack. This heretofore heavy waste of ore and fuel today is a blast furnace problem pressing urgently for solution.

Sixth. They will be located near water, either lake or river, thus affording the cheapest possible transportation costs from the blast furnace to the nearest available pig iron market of the future.

Economies for the Future

All these economies now seen and admitted by progressive blast furnace interests will be added to the merchant stack of the future, and possibly some others not as yet so apparent. However, it is not at all likely that the successful merchant stack of the future must own or operate its own railroad, other than its usual present plant facilities, because of the likelihood of the interstate commerce commission retaining its present firm grip upon the railroad rate-making facilities of the country. Thus all competitors are reasonably assured equal rates at least on their face. And there appears now strong probability that pig iron freight rates, as at present viewed by the commission will be based more than ever upon actual distances over which materials to and product from blast furnaces will be shipped to their destinations.

Steel Prices Key to Better Day in Iron Ore Industry



By A. J. Hain

Surface plant of Henry Ford's Blueberry iron mine, near Ishpeming, Mich. Built and arranged like a manufacturing establishment.

CHARLES M. SCHWAB'S reference to the steel industry as being strongly developed for operating economies, but greatly in need of a stronger sales policy has particular significance in the Lake Superior iron ore trade. Mine operators endorse what the president of the Iron and Steel institute and other leaders of the steel industry have said recently on this subject. Any betterment in the ore situation in the near future, they believe, will come from the top, rather than from the bottom.

The price of ore at present is governed almost entirely by the state of the steel market. Regardless of what the operators consider true values they are compelled to recognize iron and steel prices as indicating the amount the manufacturers of finished products can afford to pay for raw material. Time was when the operators believed a higher price for ore would justify higher iron and steel quotations, but experience has shown that price movement cannot originate at the mines—not while the mining industry is developed to produce in a year almost twice as much as the demand, and while high taxes on ore in the ground tend to force production.

Hence, the iron ore producers, and especially those depending to a large extent on the merchant trade, are much interested in what is said by steel manufacturers in procuring fair prices.

IN ONE respect the Blueberry mine near Ishpeming, Mich., is typically Henry Ford; in another way it is not. The surface plant at the Blueberry is built as Ford might be expected to build it. Instead of comprising a number of small scattered buildings, it is all under one roof; a single story building, U-shaped, with departments arranged in sequence. The building is of concrete and brick; except there is so much steel sash and glass in its walls that the interior is as light as the great outdoors. Everything is bright and clean; engine room equipment painted a brilliant red. Mining men say Ford is spending $1,000,000 *"to get ready to mine* 1,100,000 *tons of ore." And, here is the feature not typically like Ford—instead of owning the land, he leases it.*

Steel companies with holdings in iron ore mines are gradually depleting an essential source of raw material. The change is not so apparent from year to year, but over a period of years it is impressive. With the exhaustion of many high-grade mines a matter of only a few years, numerous iron and steel manufacturers are writing off their ore charges at cost, or near cost, to figure a profit for their finished products. This is having a depressing effect on the entire ore industry.

Though steel prices have shown a tendency to advance in the last few months, it is probable that not much change will be observed in the economic picture of Lake Superior iron mines for several years. At the present rate of shipments, about 275,000,000 tons will be taken out of the district in the next five years. The available reserves of good-grade iron ore, merchantable as mined, are estimated by competent authorities as about 1,500,000,000 tons. On this basis 18 per cent of this grade of ore will be removed at the end of five years. Five years will see the clean-up of many open pit mines.

There are in the Lake Superior district 154 mines that have not produced ore since 1920.

This group does not include small, or experimental properties from which negligible amounts were shipped. The mines idle since 1920 previously shipped a total of 171,419,120 tons. Many of them will not be operated

again. In contrast with this number of mines idle since 1920, only 22 new mines have been opened since that year, the majority of these new operations being relatively small.

One effect of the progressive depletion of mines has been seen in the "buying in" by steel companies on good properties; in consolidations and regroupings. This tendency will be emphasized more from year to year as iron and steel companies seek to assure themselves of a steady supply of ore. Mine values are increasing, even if quotations on iron ore appear to be standing still.

Close association between large steel interests and mine operators has spurred efforts to reduce costs at their source. Engineering ingenuity apparenty has reached its limit, as the ore industry is constituted at present.

New developments of a mechanical character have been growing scarce from year to year, while there has been a doubling, and tripling in some instances, of productivity due to the use of equipment introduced in recent years.

The need for this is seen when it is considered that in Minnesota the tax on a ton of ore as shipped is more than the labor cost of producing it. There has been no notable increase in the known deposits of ore in the past year; on the other hand the leases on a number of large mines have been surrendered, indicating the exhaustion of the mines or that it is unprofitable to work or hold them.

Mining towns in some districts of Minnesota are beginning to show the effects of shifting operations; a few of them on the eastern end of the Mesabi range appear almost deserted in contrast with their former flourishing condition.

Taxes are the main obstacle to lower cost of production. One of the most hopeful features of the tax situation in Minnesota is that an interim committee of the legislature is investigating the entire subject. However, mine operators cannot expect too much from this agitation. The policy of the state of Minnesota relating to mines has been and is one of increasing the taxes as less ore remains to be taxed.

State-owned iron ore properties in Minnesota will see larger expansion of operations relatively in the next few years than other mines. Leases to private companies on many of these mines have 20 years or less to run, and as a number of them contain large deposits it is the desire of the operators to extract all the ore from them under the terms of their leases.

Royalties paid to the state by mine operators for the third quarter of 1927 exceeded $1,000,000. The total received for the quarter was the largest ever paid for a like period with one exception.

Operations in the second quarter of 1927 brought in royalties amounting to $704,060. Total royalties paid to the state in 1926 were $2,515,000. In addition to these amounts annual rentals are paid on leases for state-owned properties from which no shipments are made.

The Oliver Iron Mining Co., Steel corporation subsidiary, paid the state

Ore Shipments Reduced 12.7 Per Cent

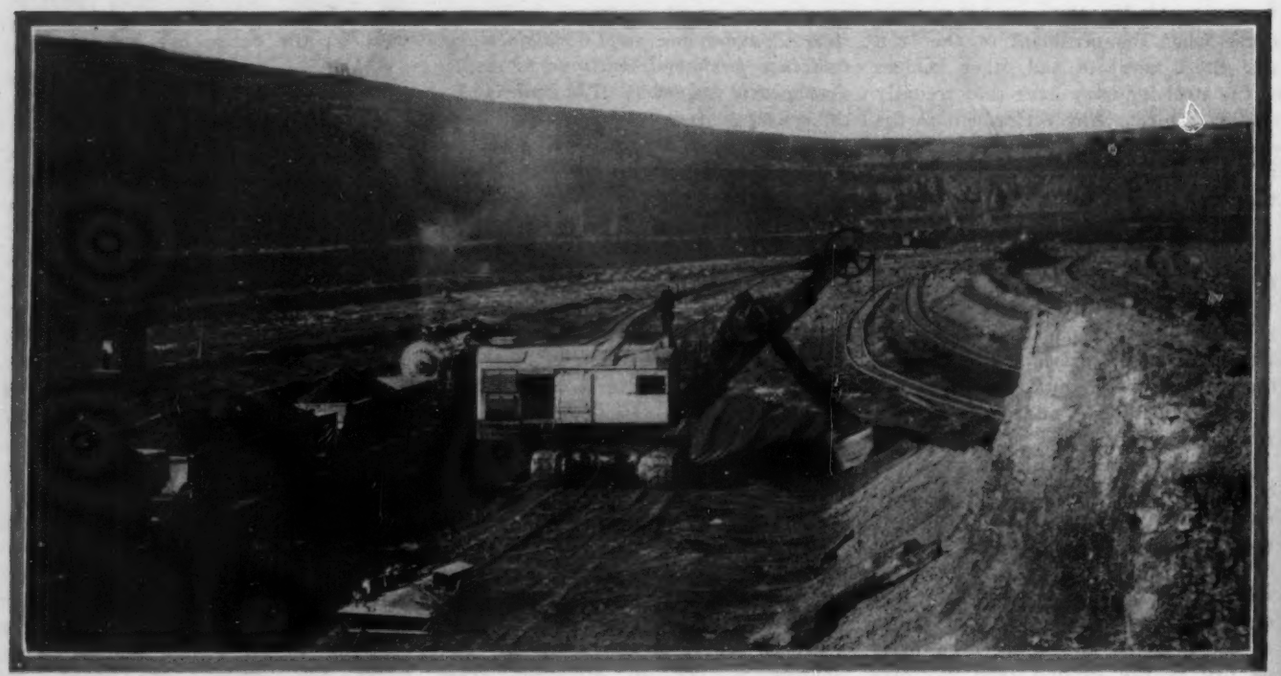
Total By Ranges

	Gross Tons 1926	1927
Mesabi	38,249,793	33,042,955
Vermilion	1,586,054	1,552,998
Cuyuna	2,091,487	1,882,329
Total Minnesota	41,927,334	36,478,282
Gogebic	7,536,389	6,389,774
Marquette	4,442,765	4,170,761
Menominee	5,945,811	5,193,319
Mayville-Baraboo	131,950	120,000
Grand total	59,984,249	52,357,136
By lake	58,537,855	51,107,136
By rail	1,446,394	1,250,000

All-rail shipments from various ranges in 1927 estimated.

By Ports and Railroads

	Gross Tons 1926	1927
ESCANABA:		
C. & N. W.	4,633,436	4,303,688
C. M. & St. P.	1,966,161	1,561,536
MARQUETTE:		
D. S. S. & A.	909,189	826,304
ASHLAND:		
L. S. & I.	2,508,273	2,412,551
C. & N. W.	5,252,970	4,497,425
Soo Line	1,886,895	1,742,349
SUPERIOR:		
Great Northern	14,614,781	12,945,606
Soo Line	1,189,421	1,091,075
Northern Pacific	672,062	591,255
DULUTH:		
D. M. & N.	18,638,395	15,432,188
TWO HARBORS:		
D. & I. R.	6,266,272	5,703,159
Total	58,537,855	51,107,136
1927 Decrease, 12.69%		7,430,719



Mining 5,700,000 tons of iron ore in a season from the Missabe Mountain mine, largest of the Minnesota state-owned properties, and recently developed as one of the largest iron ore producers in the world.

Highlights of Lake Superior Iron Ore Industry Today

ABOUT 22,000 men are engaged in the Lake Superior region in mining, hoisting and loading iron ore on railroad cars, based on operations as in 1927.

Ore is mined in seven different ranges or districts in Minnesota, Michigan and Wisconsin, and is transported over 11 railroads to 22 loading docks.

From these docks 97 per cent of the ore is transported to lower lake docks in 345 vessels, employing about 10,000 sailors; the remainder being shipped all-rail to furnaces.

The vessels have an average carrying capacity of 8500 tons on a 20-foot draft of water; actual capacity, however, being less because of lower levels of the Great Lakes.

The ore is delivered to 44 unloading docks, 26 of them being lake-front furnace docks and the remainder 18 being railroad docks, 17 of which are on Lake Erie.

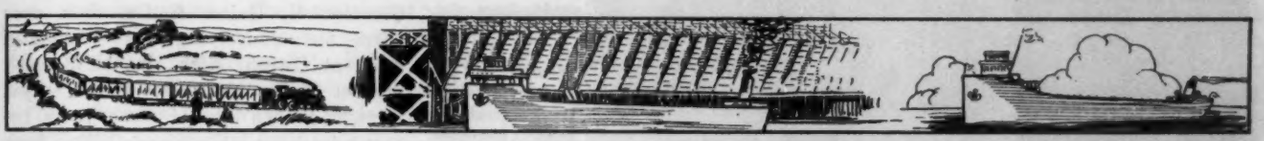
From these lake front railroad docks ore is transported by railroad to 139 furnaces in the central district and 30 in the eastern district, a total of 169, as in 1927. The number of lake-front furnaces is 97, and the number of inland furnaces receiving lake ore all-rail is 11, a total of 277 furnaces receiving ore from the Lake Superior district.

The record for unloading a lake vessel was set in 1927, a cargo of 11,445 tons being unloaded in 2 hours 25 minutes, at the rate of 78.9 tons per minute.

The value of the ore received at lower lake ports in 1927 was over $200,000,000.

About 85 per cent of all the ore produced in the United States originates in the Lake Superior district, from approximately 175 mines; and eight of the leading operators mine about 90 per cent of all the ore produced in that district.

Latest estimates show that there is available in the Lake Superior district 1,500,000,000 to 2,000,000,000 tons of iron ore of the average shipping grade of today.



the sum of $633,244.82 as royalties for the third quarter of 1927 on the Missabe Mountain mine. The size of the check reflects the increasing importance of the mine. The Missabe Mountain shipped 5,696,526 tons of ore in 1927, which is 26 per cent of all the ore shipped from the mines operated by the Oliver company in that year.

The Missabe Mountain mine shipments in 1927 were 2,752,977 tons more than the shipments from the Oliver company's Hull-Rust mine. This was the second consecutive year in which the Missabe Mountain surpassed the Hull-Rust. The Missabe Mountain's available tonnage was estimated by the state at the beginning of 1927 as 40,986,485 tons, the most valuable of all the state-owned mines.

Another state-owned property the Oliver company is preparing to mine more extensively is the Minnewas, which the state listed as having 10,762,758 tons available.

Some of the other large state mines now being operated are the Leonidas, Hill-Annex, Scranton, Poole, Wanless and Majorca. Independent operators, as well as the leading interest, have leases on state-owned mines.

Although the state of Minnesota sold ore lands at a few dollars an acre before the full extent of its mineral wealth was known, it had the foresight to keep large tracts from which it has derived enormous income. The Minnesota trust fund, made up largely from this income, on Nov. 1, 1927, totaled approximately $68,000,000, within $10,000,000 as great as the trust funds of all states lying east of the Mississippi river. This fund has been increased from $32,000,000 in ten years. The chief beneficiaries from money from this fund are the public schools, state university and road and bridge development.

The leases on three large open pit mines on the Mesabi range operated by the M. A. Hanna Co. were surrendered in 1927. One of these was the Leonard, which was opened in 1903, and which has shipped a total of 13,663,015 tons. Another was the Dean-Itasca, opened in 1915, and a producer of 6,548,000 tons. The third was the Shiras, opened in 1926, and from which about 1,000,000 tons were mined.

Another large open pit mine in the Mesabi range that was exhausted last year was the Miller mine, opened in 1904 and from which 5,825,689 tons of ore has been extracted. It was operated by the Pitt Iron Mining Co., subsidiary of the Wheeling Steel Corp.

The Hanna company is planning to open a large mine, the Missabe Chief, a state lease at Keewatin, Minn. comprising three 40's, and preliminary work has begun for stripping this summer. The company plans complete electrification of this property.

As part of its recent purchase of the assets of the Rogers, Brown Iron Co. it acquired part of the fee of the Hiawatha and the Rogers mines Menominee range, the former having the highest tax valuation of any mine in Iron county, Mich. A new surface plant has been built at the Hiawatha mine. The Hanna company in 1927 continued operating the Susquehanna mine, a large open pit property at Hibbing, Minn., which it acquired from Rogers, Brown in 1926.

Another development in mine extention work is the stripping now underway by the Shenango Furnace Co., adjacent to its present Shenango mine at Chisholm, Minn. About $600,000 will be spent for stripping and new equipment. This mine has produced to date more than 11,200,000 tons and it is estimated that the entire property still contains 3,000,000 tons or more.

The Oliver company pushed its development work on several of the ranges in the past year. Stripping work was carried on at the Minnewas, Frazer, Adams, and Spruce mines on the Mesabi range. Shipments will begin from the new portion of Minnewas mine this year. It also

opened the Godfrey mine at Chisholm, Minn., putting in electrical equipment, and will make shipments from the mine this year.

While the Wabigon mine of the M. A. Hanna Co., Mesabi range, and the Volunteer mine of Pickands, Mather & Co., Marquette range, are the only open pit mines in the Lake Superior district completely electrified, the tendency is toward further electrification.

About 60 per cent of all the underground mines in the Lake Superior district are completely electrified, including hoisting apparatus and slushing devices now extensively in use. The majority of the underground mines operated by Pickands, Mather & Co., are completely electrified. This company is the largest independent mine operator in the Lake Superior district and is the only one operating mines on all the six principal ranges. It started in 1927 to strip the Orwell mine, adjacent to the Danube, at Bovey, Minn. This initial stripping operation provides for the removal of about 3,000,000 cubic yards of overburden, and from two to three times this amount will be removed in future work. Shipping from this property will begin in 1929. Stripping was completed by the same company at the Bennett mine in 1927. From this last extension of the mine about 2,500,000 cubic yards of overburden was removed.

The Meacham mine on the Cuyuna range, operated by the company, became exhaustetd. Sinking of a new shaft at the Penn mine, Menominee range, has been started by the company, and ore will be hoisted from this in 1928.

One-half interest in the Croft mine, Cuyuna range, was sold in 1927 by John A. Savage & Co. to the Youngstown Sheet & Tube Co., which takes the entire production. The mine is now operated by Pickands, Mather & Co. The Sagamore mine shipped approximately 200,000 tons of standard manganiferous ore, and stripping was continued, especially at the west end of the pit. All development work at this property now is complete for a few years.

Ten-horsepower, double-drum electric hoist slushing ore in underground mine. Slushers or scrapers are replacing hand shoveling, with great increase in output per man

The Cleveland-Cliffs Iron Co., the largest operator on the Marquette range, is now operating nine mines, which shipped a total of 2,537,077 tons of ore during the season of 1927. The company did not open up any new mines. It closed down the Stephenson and Austin mines, where the ore had been exhausted, and gave up the lease on the Gwinn mine, which had been idle for some years. Operations at some of the company's other properties were increased, the Cliffs Shaft mine making the largest production in its history. The Republic mine, which is the oldest active mine on the range, having been opened in 1871, is still working with a few men, but the reserves are small and the remaining life of the mine is probably short.

Following out its policy of better preparation of its product the company has rebuilt its central crushing plant at Negaunee, and installed a crusher in the headframe of the Morris mine.

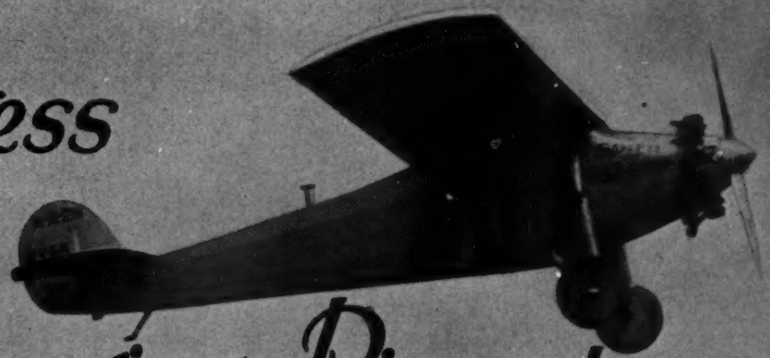
Clement K. Quinn & Co. shipped a total of 870,000 tons from their properties on the Mesabi, Cuyuna and Marquette ranges. On the Cuyuna range about 375,000 tons of manganiferous ore was shipped from the Mahnomen and Hopkins-Sultana mines. In August exploration work was commenced on a group of eight 40-acre tracts in the vicinity of the Preston property. This drilling had for its object the extension of several manganiferous ore bodies known to exist. On May 1 Clement K. Quinn & Co. took over from the underlying fee owners a mine at Gwinn, Mich., in the Swanzy district of the Marquette range. This mine had been opened some years before by the Cleveland-Cliffs Iron Co., and operated by it, during which operation it had shipped about 1,000,000 tons of an ore carrying a good iron content with about 0.225 per cent phosphorus. For several years immediately preceding, however, this property had been idle. This is now known as the Archibald mine, and production under the Quinn management from June 1 to the middle of November was about 100,000 tons.

In August underground operations were suspended indefinitely at the Quinn company's Rolling Mill mine, Negaunee, Mich., from which nonbessemer ore had been shipped for some years. Operations were suspended principally because production at the Archibald mine had progressed so that the property was able to supply ore formerly furnished by the Rolling Mill and because increased production at the newer mine made possible lower costs. The company also operated its Kruse and Empire open pits on the Marquette range at a normal rate.

One of the most important mining deals on the Cuyuna range in recent years was consummated in November. The Manganiferous Iron Co., of which Emmet Butler is president, took leases on the Mangan No. 1 mine and options on the Hillcrest and Arko mines.

(*Concluded on Page* 122)

Progress in Engineering Rises to New Heights in 1927



FROM the standpoint of engineering progress, 1927 will go down in history as a year productive of more notable achievements than in the entire previous postwar period. The spectacular demonstrations of scientific advancement which have thrilled the public have had their counterpart in less dramatic but equally important developments in industrial engineering.

The remarkable advances made in communication as manifested by transatlantic telephony, new marvels of the radio, transmission of photographs by wire and the increasing reliability of air transportation as demonstrated by the peerless Lindbergh are but the outward evidences of a deep-seated determination to solve the mysteries of science.

In the metalworking industries this determination takes the form of a desire to create better weapons against competition. The result in 1927 has been a tremendous leap forward in many branches of engineering activity. As shown clearly in the analyses on the following dozen pages, progress in the various industrial groups has been far from uniform, yet the urge for improvement is general.

In reviewing the accomplishments of the year one cannot avoid the conclusion that the characteristic most common to all is that of refinement. The authority who perceived that new rolling mill equipment calls for the use of "micrometers instead of sledge hammers" touched upon the tendency toward accuracy that is noticeable in all phases of technical development. It results from the same motive that has introduced anti-friction bearings and improved lubricating systems more generally on machine tools and has induced physicists to develop a device for measuring bars to a billionth of an inch.

Second only to the movement for greater refinement is the rapidly expanding employment of mechanical aids in industry. Several years ago the "assembly line" was a term applicable only to the automobile industry, but today scores of products progress through the various stages of assembly on moving conveyors. Manufacturers of stoves, refrigerators, washing machines, sewing machines, etc., find this method indispensable. Likewise the handling of raw materials has been entrusted to mechanical equipment in modern plants. This tendency is well illustrated by the elaborate equipment for conveying, mixing and preparing sands in the newest foundries. The automatic features of machinery, now more noticeable in new design than ever before, is another indication of this trend toward the elimination of manual operations wherever the opportunity is presented. No better examples of this can be cited than the conveying and control apparatus on heat treating equipment and the heavy manipulating devices on the latest rolling mills.

Important progress was made during 1927 in the study of metallurgy, but in this field of activity it is impossible to judge results at close range. Recognition of the value of research by the United States Steel Corp. was one of the significant developments of the year.

One of the oddities of 1927 was the fact that the greatest individual achievements were in a branch of the metalworking industry that has been notoriously backward in technical progress. The development of new methods of rolling strip steel and sheets, after years of strict adherence to conventional practice, introduced new elements into the market that may have an important bearing on the future of the industry.

Leading Technical Authorities Comment on 1927 Achievements

IN PRESENTING its annual analyses of engineering progress in the metalworking industries, IRON TRADE REVIEW *this year departs from its usual procedure and instead of publishing the opinion of one authority on achievements in each branch of industry, it records the views of many. The result of this, we believe, is a more accurate picture of the year's technical developments than has hitherto been presented.*

Naturally, the success of the new plan depended almost entirely upon the co-operation of competent authorities in the various industries. The response from those whose views were sought by IRON TRADE REVIEW *exceeded expectations and we gladly take this opportunity to express appreciation and acknowledge indebtedness to these contributors for the success of this first co-operative analysis of American engineering achievement.*

—THE EDITORS.

Improved equipment and more intelligent operation is resulting in economies

Advance in Design and Operation of Blast Furnaces Continues

BLAST furnace engineers and operators, while agreeing that steady progress was made during 1927, find it difficult to point to any single outstanding achievement in blast furnace design and practice.

Arthur G. McKee, president, Arthur G. McKee & Co., Cleveland believes that the most important achievement is the "further marked progress in perfecting the details of blast furnaces and their equipment so that their production, efficiency and quality of output now are much better than heretofore."

"Contributing largely to this end," continues Mr. McKee, "is the improved preparation of raw materials before they are charged into the furnace. Most noteworthy also is the decided improvement in the quality of coke, its uniformity of analysis, size and moisture. Perhaps the dominating factor is the increased skill in the operation of furnaces, made possible by the intelligent work of their operators assisted by the increasing number and accuracy of records of what is going on both inside and outside the stack."

P. G. Wilander, general superintendent of blast furnaces, Wheeling Steel Corp., Wheeling, W. Va. also directs attention to the achievement of "larger tonnages, lower coke consumption and better quality iron at a lower manufacturing cost"—all of which, he implies, are the results of increased hearth area, steeper bosh and increased inwall batter; increased heating capacity on hot blast stoves; and installation of more efficient gas cleaning systems at various plants.

Evidences of improved practice are cited by William A. Haven, superintendent of northern furnaces, Republic Iron & Steel Co., Youngstown, O. as follows:

"Standards of practice have been advanced along almost every line. One plant has produced 900 tons per day from one stack for the period of a full month. Another has successfully utilized average hot blast temperatures of over 1500 degrees Fahr. Still another has attained gas credits of $150 per ton of pig iron. A Southern stack reports a reduction of flue dust losses to less than 60 pounds per ton of pig."

O. R. Rice, metallurgical engineer, Freyn Engineering Co., Chicago, considers the more serious attention now paid to evaluating the by-products of the blast furnace, particularly gas and slag, as the most marked characteristic in the year's trend. Commenting on this topic, he says:

"Electric power, raised from blast furnace gas, more than ever has found an outlet to public utility power lines, or has been further applied to adjacent steel mills. Other uses for gas, which co-ordinate in uniformity of demand with the comparative uniformity of supply, such as coke-oven heating, have definitely entered the American field."

A number of observers place emphasis on unsolved problems of blast furnace operation. C. D. Rawstorne, contracting engineer, Riter-Conley Co., Pittsburgh, asks if the disposal of flue dust is not one of the principal unsolved problems. He points out that the wet washer, thickener and filter represent an investment of $150,000, on which the fixed charges and operating costs amount to $30,000 annually or about 15 cents per ton of iron produced. "Wouldn't it be worth while," he asks, "to change the design of the furnace to eliminate 90 per cent of the flue dust?"

Continuing, he states, "Recently I

(*Concluded on Page* 31)

Coke Consumption Is Last Big Problem

WHILE the percentage of iron recovered from the ore is satisfactorily near to that theoretically possible, and flux is accurately proportioned to the absolute requirement of the dross in the raw materials, the coke consumption still is about twice the amount required to perform its three distinct functions, namely to reduce the ore, to furnish the heat units necessary for reduction and melting, and to alloy it with the iron, and, with its other dissolved impurities make it into what we know as pig iron.

"A large part of the heat thus lost in the stack is recovered by burning the gas in stoves, boilers, etc., but if the carbon of the coke were all or nearly all converted into carbon dioxide in the furnace, our last big problem in the production of pig iron would be solved."

ARTHUR G. MCKEE

Refinements in design are contributing to greater efficiency in open-hearth operation

Steelmakers Seek Improvement in Open-Hearth Practice

SO MANY studies are being made of the operation and design of open-hearth furnaces that it is not easy to point to any one outstanding achievement in steelmaking. Several steelworks engineers have pointed to the paper presented in November before the American Iron and Steel institute by William A. Forbes, assistant to president, United States Steel Corp., New York, as covering in detail the principal recent developments in open-hearth practice.

It will be recalled that Mr. Forbes touched on the sloping back wall, characterizing it as "one of the outstanding improvements in recent years"; the increase of present open-hearth furnace capacity by producing larger size heats on existing furnaces and by the installation of large size stationary open-hearth furnaces; the use of large tilting furnaces for high scrap charges, which he terms an "interesting development"; and the recent installation of large stationary basic open-hearth furnaces. Mr. Forbes stated that in one case this has meant the installation of furnaces tapping 140 tons with a hearth area of 732 square feet or 5.23 square feet per ton of ingots tapped.

L. F. Reinartz, assistant general superintendent, American Rolling Mill Co., Middletown, O., points to a number of refinements that have contributed considerably to the efficiency of open-hearth operation. "Many plants", he declares "now are trying to find out how to improve the efficiency of combustion. More progress has been made along this line in plants where oil, natural gas, or coke oven gas are being used. Both indicating and recording meters have been adopted in some works to show the amount of fuel and air consumed per unit of time.

Continuing, he states:

"During the past year considerable progress has been made in securing better furnace control by the installation of fans, both on the ingoing and outgoing ends of the furnace. No doubt this method of combustion control will make rapid strides during the coming year because operation of the furnace is controlled from ends, whereas in the past with the fan on the waste heat boiler it has only been possible to partially control it on the outgoing end."

Mr. Reinartz also comments on the number of sloping back walls installed in 1927 and to the increased use of dolomite guns for making up banks.

F. L. Toy, superintendent of open-hearth departments, Homestead Works, Carnegie Steel Co., Munhall, Pa., suggests that recuperation applied to open-hearth furnace regenerators is an important recent development and in this view he is joined by several other engineers.

Blast Furnace Design Further Improved

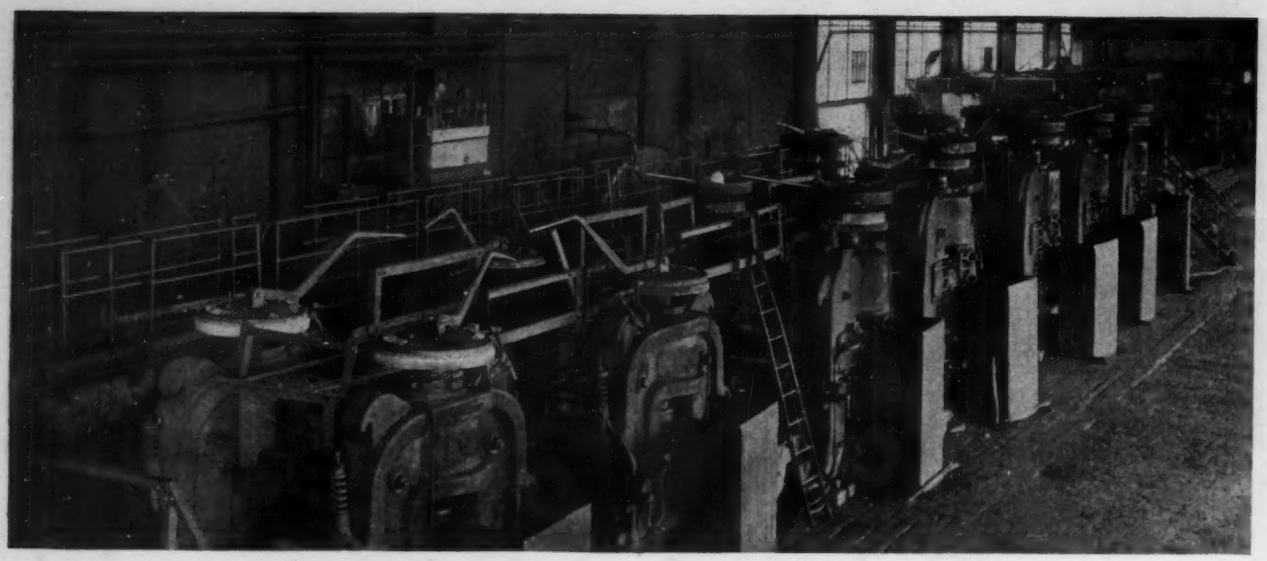
(*Concluded from Page* 30)

visited a plant where flue dust has been reduced from 500 to 30 pounds, where sludge from the cleaner was negligible."

Practically all of the authorities approached have commented on changes in furnace lines. Mr. Wilander cites the case of a Southern stack in which a radical change in design has resulted in remarkable practice. "The diameter of the stock line is greatly increased so that the proportion to the hearth diameter is reversed compared with Northern furnace design. The proportion of area of the large bell to area of stock line is one to three."

Mr. McKee does not predict any marked changes in furnace lines in the near future "except for the probable increase in stock line diameter. Further increase in hearth and bosh and volume of air blown is almost sure to cause excessive flue dust loss and other serious trouble if the stock line diameters are not materially increased and provision made for better radial distribution of coarse and fine materials at this point."

Attention has been called by several engineers to a new hot metal ladle developed by F. E. Kling, chief engineer, Carnegie Steel Co., Youngstown. The ladle is of spherical shape, the middle portion being cylindrical, the bottom approximately hemispherical and the top approximately frustoconical. The result is a ladle having extremely small radiating surface and a low center of gravity. The ladle and car are built so that the ladle can be lifted off the car to be poured into the mixer or the metal can be poured into the mixer or casting machine directly from the car. A transfer ladle is not required.



Continuous sheet mills, which promise to effect significant changes in the industry

New Ideas Overturn Traditions In Rolling Mill Industry

ALTHOUGH a rough idea of the approaching importance of the continuous process of rolling sheets and strip had been current for a number of years, it required the startling events of 1927 to drive home the full significance of this development.

All authorities approached by IRON TRADE REVIEW on the subject of developments in the rolling of steel are in agreement on the far reaching effect of these new mills. Their comment is well summarized in the following words by F. C. Biggert Jr., president, United Engineering & Foundry Co., Pittsburgh:

"The installation of mills for rolling wide strips doubtless is the outstanding development of the year. It has made possible the first departure from the classical methods of sheet production.

"These mills have not been in operation long enough to warrant definite statements as to their ultimate accomplishments, but the breakaway from the sheet bar has been definitely made and this in itself is sufficient to place the new mills in a pre-eminent position.

"All branches of steel rolling except sheets have long since been highly developed by the application of power and mechanical equipment. Sheet rolling alone has remained a matter of personal skill and physical strength. Improved furnaces, mechanical doublers, heavier mills and the like have increased production and reduced costs, but fundamentally the process has not changed. The skill and ability of the mill crew have been the limiting factors.

"Now it appears we have new means of removing this limitation."

In likewise according the successful mechanical production of sheets distinction as the greatest achievement in the rolling mill industry, Barton R. Shover, consulting engineer, Pittsburgh, comments as follows:

"Although only a year has passed since the first continuous sheet mill was started, and a matter of months for the other three, the product now is generally acceptable to the trade because of its uniformity. Apparently No. 16 gage is as light as can be commercially rolled hot at present, full finished sheets being made by cold rolling from the heavier gage product. . . .

"The salient feature in present day mill design is accuracy. The day of the 'converting mill fit' has passed and the wooden rule is fast giving way to the micrometer. Some of the latest installations appear to be a little more elaborate than is necessary, but perhaps they are only 'ahead of the times,' since progress continues to be the watchword of the industry."

O. Needham, engineer, steel mill engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., points to the many advantages of the continuous process. "This method," he says, "conserves the heat of the steel by rolling the material quickly after it leaves the furnace. This saves power. It also requires less manipulation of the hot metal and lends itself readily to the use of mechanical devices for manipulation so that the labor item is materially reduced."

Mr. Needham also points to the fact the continuous process is only adaptable where large tonnages are required "as this type is inherently a high-tonnage mill." He is joined in this view by an engineer closely identified with the development of the continuous process, who observes that

Sees Opening for New Markets for Sheets

IF PRESENT indications are borne out by actual experience, we may expect to see sheet steel selling at prices sufficiently reduced to make possible its use for a multitude of new purposes. It should be noted, however, that this has not yet been accomplished. The new mills represent large investments and require large tonnages and large individual orders to make their operation profitable. From an operating standpoint, they still are in an experimental state and it is doubtful if any of them has yet shown costs lower than can be made by established methods."

F. C. BIGGERT JR.

it is strange such a development should have been so long in coming. "But possibly it may be explained," he continues, "by the fact it had to wait for the sheet business to grow to where much larger tonnages were required and for a new generation with increased knowledge." This view is appropriate in view of the expensive failure about 22 years ago.

Will the success of rolling sheets affect methods employed for other steel products? One who has been watching the sheet mill developments thinks "it is well within the bounds of possibility that the rolling of tin plate and the processing of both tin plate and high finished sheets will be affected to a profound detail."

Much has been written on the economic status of the new mills. Mr. Shover offers the following views on this point:

"The three continuous sheet mills now operating have a rated capacity which would supply only about 20 per cent of the total average sheet requirement. Therefore until additional mills of this type shall have been built, the present sheetmakers will have to supply 80 per cent of the average demand. Even if the number of mechanical mills be more than doubled, the higher gages, amounting to about 50 per cent of the total average requirements, will be rolled by the old method until further advances are made. . . . In the steel world, as elsewhere, whatever is economically sound, will, in the end, prevail."

Another view of the economic phase, presented by an engineer in executive position who prefers not to be identified, follows:

"The two avenues of approach to the rolling of wide material are from the sheet phase and the strip phase, and, as recorded in the paper read by S. Badlam before the October meeting of the American Iron and Steel institute, the sheet development made the greatest step forward, while the strip process has not yet been able to reach the ratio of width to thinness that is now regularly employed for the manufacture of sheets.

"It will be interesting to watch the development of these two methods of solving one of the outstanding problems of the steel industry. It is entirely possible that each will find its own economic limitations."

We are reminded that an unusual situation exists in regard to the patents for continuous rolling. Our unnamed informant writes:

"Another phase of interest in this portion of the steel industry is that most of the inventions and discoveries necessary for the successful operation of the new method have been covered by patents, possibly to a greater extent than any single section of the steel industry save perhaps that of wire. The rolling process and machinery and the subsequent processing, annealing, pickling, etc., all come within the scope of this protection. It would be unfortunate indeed if the situation were handled in any but the broadest, fairest manner, for which the leaders of the American steel industry are eminently fitted."

However, progress in the rolling mill industry was not restricted to improvements in the rolling of strips and sheets. In its annual review of engineering developments the Westinghouse Electric & Mfg. Co. hails the Carnegie Steel Co. structural mill at Homestead as a major achievement, "conceded by European authorities to be the world's best."

The installation of this mill and of one at the Lackawanna plant of the Bethlehem Steel Co.—both designed for wide flange beams and placed in operation within the year—elicited comment from several engineers. J. D. Wright, General Electric Co. is authority for the statement that "from the standpoint of total horsepower involved, the Lackawanna mill is one of the largest in the country." The latter mill is a 48-inch unit.

Attention is called to the more general use of anti-friction bearings. One of the most interesting examples, according to several observers, is the new 84-inch tandem plate mill placed in operation early in the year by the Lukens Steel Co., which, to quote one authority, "embodies some new features for a mill of this kind, such as roller bearings backing-up rolls."

Interesting to several engineers is the design of a mill motor on soleplates instead of on a bedplate. This motor, which will drive a 32-inch reversing bar mill for the Jones & Laughlin Steel Corp., is "one of the first reversing steel mill motors fed by a synchronous motor-generator set."

Existing tendencies in the electrification of mills are progressing rapidly and due to the fact that the use of electric drives "promotes the handling of material with mechanical devices and cuts down to a large measure the labor charge in the mills, it is contributing greatly to present day economies being effected in the industry."

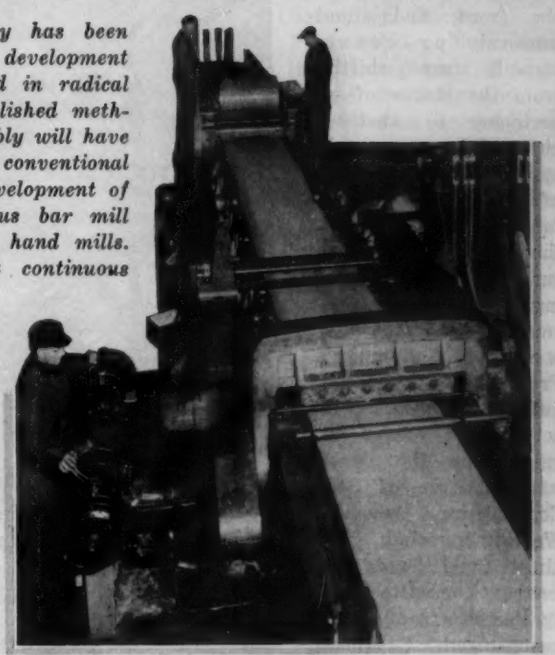
It would be a mistake to dismiss the achievement in the rolling mill industry without mention of the numerous developments in mills for rolling practically every material. The developments in wire rolling mills and in semifinishing mills, according to one authority, "have been in the direction of the continuous rolling of this material."

In general the improvements of the past year in all directions fall under the classification of refinement, not only in the manner of design and construction of the mills themselves, but also in the details of controlling and manipulating equipment.

How One Engineer Views New Mills

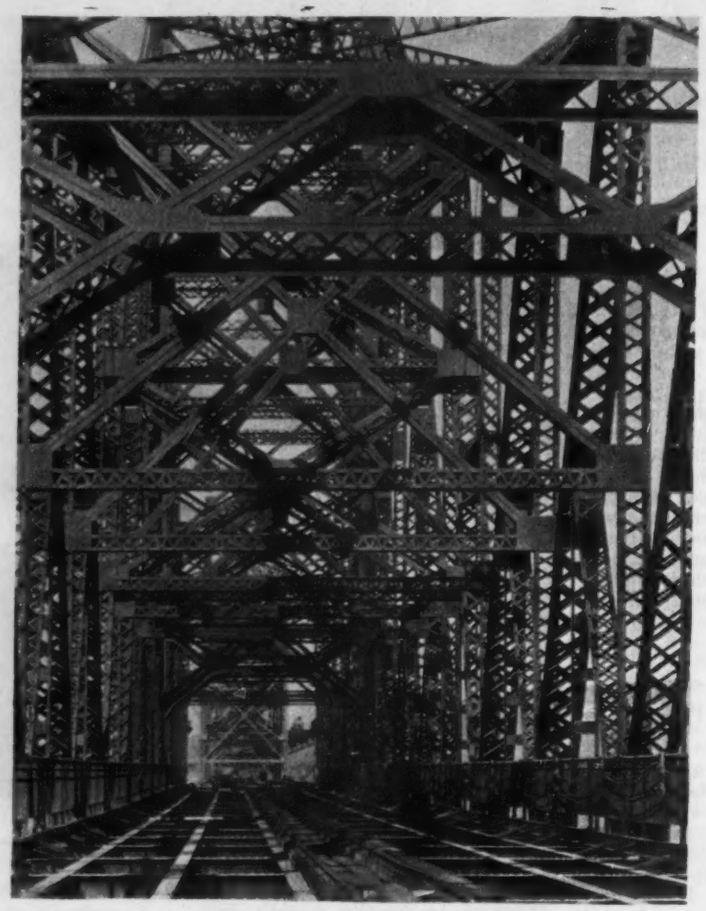
THE sheet industry has been going through a development which has culminated in radical departure from established methods, and which probably will have the same effect on conventional sheet mills as the development of the modern continuous bar mill had on old-fashioned hand mills. Just as the present continuous merchant mills are only economical for large tonnages, so the new method of making sheets will by the law of economics be applicable only to large tonnage plants."

This is the opinion of one who has been closely identified with the new process.



1927 Witnesses Marked Advance in Processes of Fabrication

IN NO division of the metalworking industries is the advancement in methods and equipment more pronounced than in that of steel fabrication. Almost every step in the shaping, joining and assembly of steel and nonferrous metal parts is being studied for possibilities of improved practice. New ideas are constantly coming to the front, and simultaneously processes steadily are shifting from the status of experiment to that of successful commercial application. This is true of practically every fabricated product in the range from structural steel for buildings and bridges to the smallest riveted or welded stampings. Progress in this broad field is hastened by the activities of three organizations—the American Institute of Steel Construction, American Welding society and Sheet Steel Trade Extension committee—and by the efforts of a few unorganized groups. Notable among the achievements of the year is the specification for fireproofing prepared by H. G. Balcom, Frank Burton, A. R. Ellis, S. H. Ingberg, Rudolph P. Miller and F. E. Turneaure for the American Institute of Steel Construction. Many engineers pronounce this specification as a great step forward in the solving of problems of building construction. It "defines basic conditions relative to the insulation necessary to protect structural steel, provides data that will enable the classification of fire hazards, defines the physical characteristics of structural steel within the temperature range that it is capable of carrying, the working stresses used in designing, and defines fire tests procedure."



Progress in structural fabrication is marked in design and methods

Other notable work in the engineering of fabricated steel are studies on tensile working stress of rivets and on practical design for wind bracing.

Production in 1927 of a new line of wide flange structural beams and the competition between these and the Bethlehem sections of long standing in the fabricating field may affect the trend of practice in built-up columns. Already elaborate equipment for laying out, drilling and riveting members by a new method has been built and installed. Indications point to improved riveting equipment for many fabricating operations — particularly those in which the urge for greater speed in production has been emphasized. The trend in the design of riveting equipment is toward specialization. Single-purpose riveters, installed at convenient stations along the assembly line, are gaining favor in a number of industries.

No single phase of the fabricating problem has aroused more interest than the application of welding. The American Institute of Steel Construction and the American Bureau of Welding are co-operating in a study of the application of welding to structural steel. F. M. Farmer, president, American Welding society, New York, believes that "the welding art has made much progress during the year, notably in its application to larger steel building structures, in the construction of large automatic arc-welding machines and in the development of spot welding machines for high speeds in factory production operations. However, while there has been a marked technical advance in the field of welding, the most encouraging feature of the year's activities is the growing recognition of the desirability of conservative expansion — expansion based on demonstrated advantages and sound engineering." J. F. Lincoln, vice president, Lincoln Electric Co., Cleveland, names the outstanding developments in welding as follows:

1. Greatly enlarged substitution of arc welded structural steel for parts previously cast.

2. Rapid development of automatic welding.

3. Greatly increased trust in usual hand welding and its proof because of this development of its universal satisfactory performance.

Another who stresses the application of welding to structural steel is James W. Owens, director of welding, Newport News Shipbuilding & Dry Dock Co., Newport News, Va. Mr. Owens declares that the "greatest engineering achievement during the year is the marked increase in the use of arc welding on structural work based on sound engineering principles.

Its application to structural work is increasing rapidly."

R. E. Kinkead, consulting engineer in arc welding, 3030 Euclid avenue, Cleveland, believes the outstanding trend of technical development in arc welding in 1927 is the "progress in the direction of improving the metal of the weld by the exclusion of the atmosphere from the metal while it is hot. Ductility and corrosion resisting properties of the weld metal have been known to be low when the welding operation is carried on in such a manner as to expose the hot metal to the atmosphere. During 1927 the equipment builders have acknowledged these facts by improving the operation to overcome them."

The interest of Comfort A. Adams, Harvard Engineering school, Harvard university, Cambridge, Mass. has been largely confined to a better understanding of the phenomena involved. "Unfortunately," he says, "these phenomena are terrifically complicated, not only from the standpoint of the physics of the problem, but also from the metallurgical standpoint. Many of the practical problems cannot be solved without a more thorough understanding of the theory."

Continuing, he writes:

"To this end the American Bureau of Welding has made every possible effort to stimulate what might be called fundamental research in this field, but has found the industry rather loth to contribute thereto. However, considerable fundamental research work is being carried out in connection with the co-operative research established in connection with specific applicational problems in which the industry is interested; for example, in connection with the pressure vessel research and the structural steel research."

"In connection with all of these, considerable progress is being made in the development of tests to determine the quality of the work. Progress also is being made in the training of welders in the development of what has come to be called 'procedure control,' involving a frequent checking of the quality of the work done by the welders as well as a competent inspection thereof."

Welding holds the center of the stage in many fabricating operations

Eric H. Ewertz, consulting engineer, 50 Church street, New York, believes that the greatest achievement in welding has been "the welded construction of pipe lines for water, oil and gas service with miles of piping satisfactorily welded and tested."

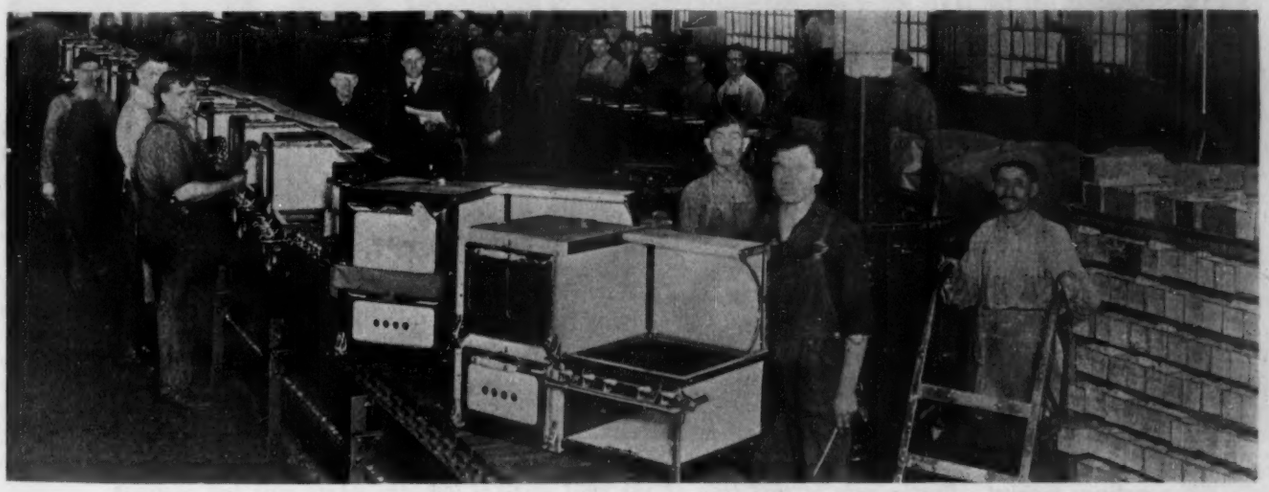
"Marked progress," he continues, "is also to be found in connection with welding of rail joints and accomplishing thereby remarkable economical results. Also considerable progress has been made in structural welding as well as in the adaptation of resistance and automatic welding in production welding in production work making barrels, containers, piping, furniture, refrigerators, electric motors and generators."

William Spraragen, technical secretary and editor, American Welding society, New York, believes that insofar as applications of welding are concerned, the "five-story Westinghouse building and the 90-mile, 65-inch Mokelumne pipe line are outstanding examples."

Commenting on oxyacetylene welding, O. C. Carter, consulting engineer, Linde Air Products Co., New York, states that the "management of welding has improved decidedly and numerous large jobs were accomplished during 1927."

"It has become generally recognized that competent men can be obtained through a qualification test. It also has been recognized that a high grade of deposited metal can be obtained by the use of suitable welding rods or filler material."

"In my opinion," Mr. Carter declares, "the outstanding job of the year in the application of oxyacetylene welding is the construction of the natural gas line from Amarillo, Texas, to Wichita, Kans. This line, 20 inches in diameter, is 250 miles long and is a composite line in that rubber couplings are used at intervals of from three to five joints, the rest being oxyacetylene welded. The welding organization of about 100 men was organized without particular trouble and the work has been carried on to the full satisfaction of all concerned."



One of the features of fabricating is the adoption of the assembly line in many branches of industry

Mechanics of Heat Treating Are Better Applied to Work

IMPROVEMENTS in furnace design and the attainment of higher efficiencies appears to be the high light in the heat treating and metallurgical fields. The outstanding development in 1927, according to H. M. Boylston, head of the department of mining and metallurgy, Case School of Applied Science, Cleveland, "has been the continued effort to utilize electric current for heating furnaces for treating steel and the concurrent developments of recuperators and other saving devices for gas and oil-fired furnaces. The control of temperature and the development of automatic devices for handling material in furnaces has come to a high degree of perfection, but there is always opportunity for advancement."

Professor Boylston states further:

"The time has passed when 'the man at the fire' has to peer into the furnace with his hands shading his eyes, then remove the metal from the furnace by brute strength. He is now free to use his brain instead of his brawn in devising new methods of controlling the furnace and contents and interpreting the results of scientific tests instead of sweating before the furnace in an agony of heat and muscular exercise."

W. S. Bidle, president, W. S. Bidle Co., Cleveland, and a past president of the American Society for Steel Treating believes "that the year shows the usual steady progress toward the better mechanical application of the principles of heat treating to the actual performance of the work. In other words, the refinement of furnace design to meet the requirements of more accurate heat treating. Continuing he says:

"There is a continued strong tendency toward the installation of electric furnaces, and it is no doubt true that the ease with which satisfactory automatic temperature control can be applied is a strong deciding factor in their selection. Control of temperature by automatic means as applied to fuel-fired furnaces is susceptible to much more refinement, but the problem is not as simple as with the electric furnace."

Furnace Design Is Improved

Present trends in furnace design are classified by O. E. Harder, professor of metallography, University of Minnesota, Minneapolis, as follows:

"1.—Automatic pyrometric control; 2.—Continuous flow of work through the furnace with the furnace in the line of production; 3.—Conservation of fuel by better insulation and the utilization of waste heat to preheat the charge or for regeneration; 4.—Use of smaller units in order to secure better uniformity of temperature when the size of the work will permit; and 5.—Use of electric furnaces where power is not too high, or where the material to be heat treated will warrant increased cost to improve the quality."

W. J. Merten, materials and process engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is of the opinion that "progress in furnace design centers mostly around conditioning of heating chamber atmospheres for minimum oxidation or scaling. This is equally true in electric furnace design as in gas and oil-fired furnaces. Fused salt bath furnaces have been built of large dimensions and non-scaling heat of parts for heat treating as well as hot mechanical working is practiced extensively. A great deal of engineering development in furnace chamber design and design of salt containers is being carried on. Mr. Merten continues:

"Low temperature control apparatus is developed to a very appreciative degree of accuracy, any further refinement would be impractical. However, temperature control, yes even temperature measurement above 2000 degrees Fahr., is everything but satisfactory and real engineering development is required to bring apparatus for control measurement in this temperature range, into satisfactory condition. Work done in these temperature ranges includes heating for hammer forging, press forging, drop forging, rolling and welding;

Industries using steel are forced to make full use of heat treatment to continue their existence in the highly competitive market. Particularly is this true of the steel castings industry where now few castings are put in service without treatment.

Notable among furnace developments of 1927 *was the belt conveyor type of continuous furnace developed by the Victor-Peninsular Co., Detroit, for heat treating high-quality cap screws.*

heat treatment of large section forgings and steel castings and heat treatment of high-speed steel."

Another development of the year, according to Mr. Merten, "is the steel foundries' acceptance of the necessity of improved grain structure in the steel castings brought about by heat treatment for greater uniformity and ductility. There is hardly a single steel casting of any size which is put into service in the raw or as-cast condition."

Speaking along similar lines, Professor Harder reports that the increase in the amount of material heat treated in the Minneapolis vicinity has ranged from 10 to 100 per cent. Eight years ago the heat treatment of steel castings was rare, probably not over 5 per cent undergoing treatment. At present three companies manufacturing steel castings are working on 100 per cent heat treatment. The average increase of heat treatment for these companies over 1926 was about 50 per cent.

Nitrogenizing Looks Promising

"Case hardening by nitrogenizing is a new development and from the information available seems to be a very attractive field," states Professor Harder. "Its ultimate importance can not be predicted from the information at hand and its general use may be somewhat restricted because of certain patents." Mr. Merton states that in the nitride hardening of suitable alloys, the American investigators have been quite revolutionary in the selection and manufacture of the alloy. The results are as follows:

"1.—An exceeding hard case of appreciable resilience; 2.—A very strong core of 100,000 pounds per square inch minimum tensile strength and a high elastic strength of not less than 50,000 pounds per square inch; 3.—A reduction in time of the cementation process so as to bring it within competitive figures to cementation with carbon; 4.—Noncorrosive properties of a high degree; 5.—A nondeforming nonshrinking hard steel requiring no finish machining after hardening."

Mr. Merten concludes by saying, "The general aspect of this development is a considerable step towards a steel of good abrasive or wear-resistance coupled with considerable strength and fair ductility and resistance to corrosion at a reasonable or commercial price."

"While the developments in heat treatment are quite gratifying," says Professor Harder, "it is still true that many plants, particularly the smaller ones, are not taking advantage of the benefit to be obtained by heat treating, or if they are heat treating, they are not treating to the best advantage. Looking into the future, Professor Harder says:

"In conclusion, it is my opinion that those industries using steel will be forced to come to the use of heat treatment to continue their existence in the highly competitive market which obtains today. There is much to be done in the way of education with reference to the importance of heat treatment and the best methods and considerable responsibility in regard to this unsolved problem rests upon educational institutions."

Unsolved problems are listed by Professor Harder as follows:

"1.—Education; first as to importance of heat treatment, and second, as to the best methods of heat treating; 2.—More extensive use of metallographic methods in the selection and inspection of raw materials, in controlling the heat treatments and in the inspection of finished products; 3.—Refinement and simplification of equipment; 4.—Improvement in oil-burning equipment, especially for the use of heavier oils; 5.—Construction of furnaces to give greater uniformity of temperature; 6.—Development of more efficient furnaces for the forging industry.

Mr. Bidle is of the opinion that there is no great unsolved problem in heat treatment, but presumes each manufacturer has some particular one of his own which more or less keeps him awake at night. Mr. Merten believes the most important unsolved problem is "what are the structural requirements for a good permanent magnet steel and how can it be produced consistently and selectively by thermal treatments."

Steel Under Investigation

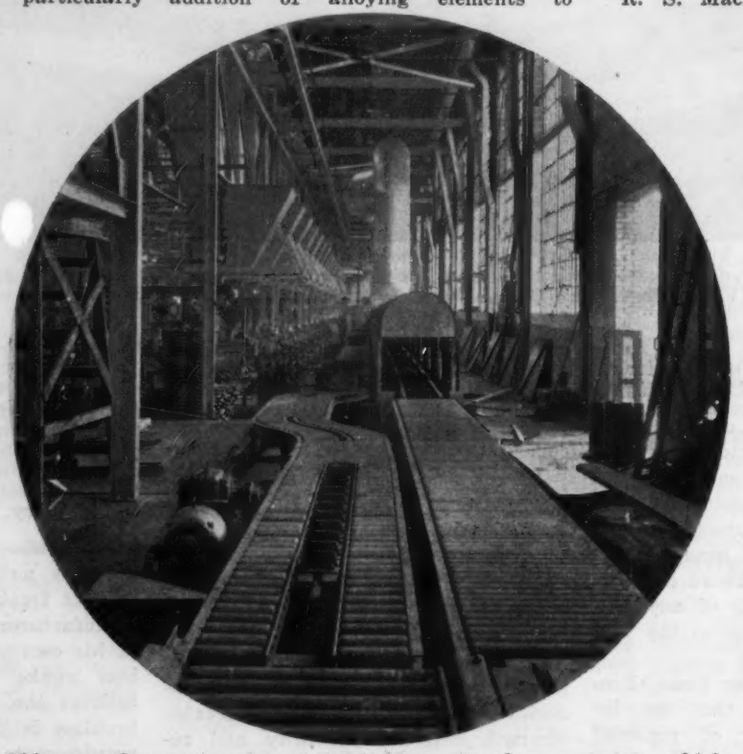
Little mention has been made of progress in investigational work in steels during 1927, however, space does not permit discussion of this subject at length. Knowledge of steels, their manufacture, treatment and behavior has been augmented considerably by numerous researches. Perhaps one of the most important lines of investigation is the study of hardening and its results.

Two researches by Dr. Zay Jeffries and his associates are notable; one a paper by Dr. Jeffries and W. P. Sykes, "On the Constitution and Properties of Hardened Steel," was published in the December issue of the *Transactions* of the American Society for Steel Treating; and the other some researches by Dr. Jeffries, Miss E. Chartkoff and A. B. Gladding, described in the Campbell Memorial lecture presented at the annual meeting of the American Society for Steel Treating in September.

Foundrymen Gain in Metallurgy and Handling of Material

PROGRESS in the foundry industry during 1927 has been largely in the application of labor-saving equipment, particularly for conveying and handling, and in the development of "high-test" castings.

Dan M. Avey, editor, *The Foundry*, Cleveland, points out that "large production foundries, notably those in the automotive casting and radiator lines, have made great strides in the application of mechanical handling devices. One automobile cylinder shop offers an outstanding example of this. Sand is handled from the shakeout through suitable treating processes, returned to the molding stations and actually delivered into the flask entirely by mechanical means. All molds including flasks, bottom boards, etc., move on conveyors. Castings are shaken out mechanically, picked up and swung off through the air for several minutes to permit them to cool. This plant handles all of its fuel and iron mechanically."



This scene in new foundry of Buick Motor Co. shows extent to which mechanical aids can be utilized in modern production shops

A. B. Root, Jr., assistant vice president, Hunt-Spiller Mfg. Corp., Boston, believes that 1927 has witnessed "a remarkable extension of scientific operation and management in the foundry. These influences have resulted in tremendous economies through the conservation of raw materials and improvement of the product. Also they have brought about greater production per molder and at the same time have lessened the physical burden of the workmen."

Another who feels that mechanical developments have led to important achievements is E. A. Custer, Jr., foundry engineer, Philadelphia. "The elimination of molding skill by mechanical devices, saving of labor by skillfully designed machines, the study of causes and reduction of losses" are the important developments of the past year in his opinion.

Many authorities are impressed with the progress made in the study of gray iron metallurgy, particularly in the addition of alloying elements to secure desired qualities. Dr. Richard Moldenke, Watchung, N. J., declares unhesitatingly that the outstanding development of today is "the achievement of high-test material—almost phenominally so—and knowing how to do it". Commenting on this development, he says:

"Exceptionally high test cast iron has been made before, but the ability to repeat the performance regularly because the rationale of the process has been established scientifically is new".

Sees New Era for Foundries

Looking to the future, Dr. Moldenke thinks it possible that a new lease of life may be given the gray iron foundries if they will avail themselves of this new knowledge. He concludes:

"Yet the desulphurization of constantly deteriorating scrap piles, the production of high grade cast irons through the application of extreme temperatures in melting and superheating the mixtures aimed for low total carbon there should be a new era dawning for our 500-year old industry."

R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, also calls attention to the general awakening of interest in the development of high test cast irons and alloyed cast irons. "There is an increasing hope," he says, "that the heat treatment of alloy cast irons will become commercially possible. The trend of engineering development is toward higher stresses and it must be met by better material."

In the opinion of F. L. Wolf, technical superintendent, Ohio Brass Co., Mansfield, O., more attention than ever is being paid to "molding sands and core sands and in the nonferrous field a great deal of attention is being given to the proper pouring temperatures of metal. Many foundries are spending considerable sums of money for pyrometric equipment and are actually using it as a necessary tool."

Mr. Wolf's reference to the attention being paid to molding sand brings up a subject which has gained decided prominence in the past few years. Many leaders in the foundry industry believe that the study of molding sand has been responsible for encouraging foundrymen to improve the handling and preparation of sand and that this with the more widespread utilization of mechanical equipment for this purpose already has cut down casting losses considerably.

Hope for better conditions in the foundry industry was aroused by a paper presented by Mr. Custer, at the recent meeting of the National Founders' association. His outline of possibilities, particularly in the field of gray iron castings, indicated the opportunities in that industry for combating the competition of other industries.

Refractories Research Points Way To Quality and Uniformity

ACCORDING to a number of authorities in the field of refractories, unusual attention has been devoted in 1927 to the improvement of common as well as so-called "super" refractories.

M. C. Booze, vice president, Charles Taylor Sons Co., Cincinnati, declares that "while there have been no radical changes in fire clay and silica brick, still there is a noticeable tendency toward better quality, greater uniformity of size and the extended use of delivery presses and tunnel kilns in the manufacturing processes."

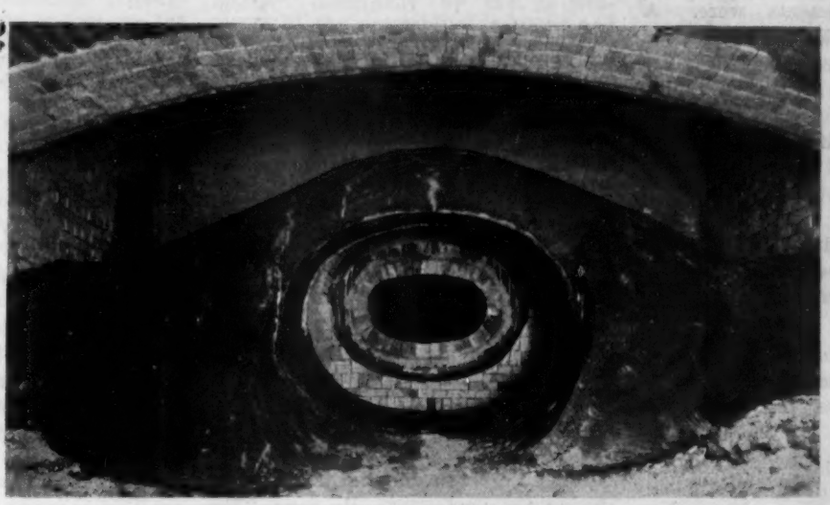
The General Refractories Co., Philadelphia, sizes up the technical developments of the year as follows:

"The year has witnessed further improvement in the quality and performance of refractories not only for the 'super-refractories' but more especially for the commoner kinds which constitute the bulk of requirements. Better raw materials are entering into the products, workmanship is greatly improved, plant equipment shows continued development, and tunnel kilns are projected for silica and basic brick. Laboratories are exerting closer technical control, following each step in manufacture and maintaining careful check upon quality. More research is being practiced. Consumer and producer are in closer co-operation to make this work more effective."

This same authority believes that the following projects have registered noticeable progress: The production of better inwall brick for blast furnaces, improved silica brick from automatic molding machines, advantageous use of high alumina brick in the open hearth and more efficient use of basic and neutral refractories for special problems.

E. M. Weinfurtner, secretary and treasurer, Ashland Fire Brick Co., Ashland, Ky., believes that the standard specification for fire clay brick now receiving consideration by manufacturers of refractories is of great technical importance. He states that "this task presents many difficulties for in addition to determining service conditions and requirements of any type of service, means must be devised by practical tests to ascertain if and to what extent the refractory offered will meet the service for which it is required."

Several observers point to the progress being made in the use of newer materials. A. P. Green, president, A. P. Green Fire Brick Co., Mexico, Mo., considers the most outstanding development during the year to be "the progress arising from the use of brick made from diaspore and high alumina clays. Of all the super-refractories now on the market my opinion is that refractories made with a base of diaspore are the most reliable, rugged and trustworthy, and at the same time being reasonable in cost. New developments of diaspore material are being brought forward which have great promise of establishing it more firmly as a super-refractory."



Manufacturers and users are striving for better open-hearth refractories

C. E. Bales, production manager, Ironton Fire Brick Co., Ironton, Ohio, explains how improved production methods are affecting the quality of refractories. "Uniform quality is the watchword", he says, "and most plants have been installing heavy machinery to do away with inefficient hand labor. The firing of refractories has been given the attention it deserves and the tunnel kiln has been developed to the point where it can fire refractories economically. It is significant that the world's largest producer is building tunnel kilns not only for clay refractories but for silica as well."

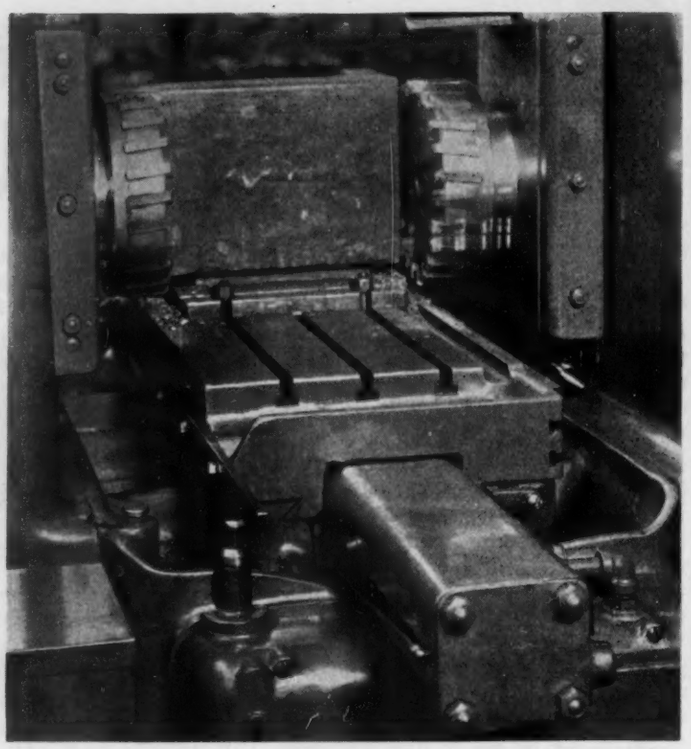
Another authority points to the rapid growth in the use of minerals in the sillimanite family for higher quality refractories. "Material of this type was largely in the experimental stage until a year or so ago and it is only during 1927", according to Mr. Booze, "that we have seen the application in quantity in metallurgical furnaces."

He also comments on the technical developments in progress on diaspore, disapore-chrome combinations, light weight fire clay brick and chrome brick which hold promise. Attempts to produce non-shrinking diaspore brick commercially have not been entirely successful, but encouraging progress has been made.

Mr. I[illegible]e points to the studies being made on the spalling of refractories and states that one of the greatest needs is a non-spalling basic slag resisting fire brick. He predicts that final development of a suitable spalling test method can be expected within a short time.

No more hopeful conclusion can be drawn than that voiced by Mr. Bales who says: "From the technichal standpoint the refractory industry seems to be in better condition than it ever has been in its history, and there is every reason to believe that more progress will be made in 1928. Technical developments of refractories has been of a substantial character during the year just closed. Consumers have co-operated with producers to a large extent in securing data on the service conditions existing in various types of metallurgical furnaces. They also have been of assistance in the preparation of reasonable specifications."

Refinement Is Mark of Recent Machine Tools



Hydraulic feeds have become more popular during the year. The table on this new milling machine is operated hydraulically

WHILE authorities may disagree as to the relative importance of various developments in machine tool design during 1927, they are in agreement as to what these developments were. A summary of individual expressions indicates that the principal progress of the year was largely of a refinement nature and includes: 1.—Increased use of antifriction bearings; 2.—Increased use of hydraulic feeds; 3.—Improved lubrication system; 4.—Standardization of milling machine ends; 5.—Increased strength; 6.—Improvement in appearance; Development of more automatic feeds and station operations.

E. F. DuBrul, general manager of the National Machine Tool Builders' association, expresses his opinion as follows:

"Developments along these lines were so marked and appeared in so many different classes of machine tools that it seems fair to assume that they indicate the general trends which can fairly be expected until such features are the general rule. There was an increased demand, particularly on the part of users, for additional standardization in machine tool elements. This demand has resulted in the inauguration of several more new projects on the part of the sectional committee operating in the field under the procedure of the American Engineering Standards committee.

"One important project now under way is the standardization of tapers, the belief being that a taper of ¾-inch per foot should be substituted for all tapers of similar slope. The movement for standardization of mounting and overall dimensions of electric motors is one that affects all who use motors for driving machinery. Another movement of wide interest is the proposal to establish standard initial speeds for driven machinery.

"All of the above standardization projects naturally indicate healthy and desirable engineering progress and indicate that American industry is awake to the desirability of such standardization which affects the interests of both users and producers and will in time simplify their problems and lead to great economies of various sorts."

Designs Are Simplified

J. A. Smith, general superintendent, General Electric Co., Schenectady, N. Y., thinks designs turned out by the majority of high-priced manufacturers have been simplified materially during the past year. He says, "The more general use of roller and ball bearings seems a long step in the right direction and will undoubtedly become more general. The use of hydraulic features by a number of manufacturers appears to have a promising future, and the more general use of forced lubrication should tend toward longer life and more satisfactory operating conditions." He continues:

"The incorporation of power rapid traverse on milling machine tables, planer and boring mill cross rails, and in other parts of similar machinery should tend to cut down the effort on the part of operators and enable them to apply their physical resources to the production of greater output, and a further extension of these efforts on the part of designers and builders will unquestionably be to the advantage of the trade."

Discussing the standardization of milling machine spindle ends, J. Q. Salisbury, supervisor of machining and tool divisions, National Cash Register Co., Dayton, O., believes this development will work to a decided advantage in turning over obsolete machinery. It is his opinion also that the use of antifriction bearings, especially roller bearings, in cutter spindles will go far toward eliminating spindle troubles and lubricating troubes at this point. Mr. Salisbury says:

"Adoption of hydraulic feeds for metalworking machinery is a step in the right direction of eliminating some of the complications which arise while providing for the necessary ranges of feeds and speeds on machine tools and in addition providing a much more powerful drive. This feature should reduce maintenance cost also. Some manufacturers have given considerable thought to machine tool lubrication problems. Others have provided ample lubrication, but have failed to provide ample control. In other words, the effect of lubrication has been lost in not providing facilities for its retention.

"The general trend of design seems to be in the line of single-purpose machinery. This is a sound condition, as it has a tendency to speed up production and improve quality in that the machines can be constructed with more stability. In my opinion, one of the greatest steps that could be

taken by the machine tool business as a whole, would be the development of machines upon which jobs could be set up quickly. In the small mechanism manufacturing industry, one of the greatest losses of time is caused by frequent changing of jobs and consequent loss of time in setups."

E. W. Johnson, Singer Mfg. Co., Bridgeport, Conn., is impressed with the "massiveness of most all types of machines, which shows a step in the proper direction for increased production with the newer type of high-speed steels as well as rigidity which is necessary for the close manufacture of parts where interchangeability is paramount." Mr. Johnson continues:

"The improvement in the lubrication is very noticeable. The use of ball bearings and roller bearings to my mind is limited to high-speed light-running machinery, such as grinding spindles, etc. I do not believe that plain bearings can be eliminated in such places as screw machine spindles, or grinders, in other words, when the part machined must be as near perfect as possible.

"The big problem in machine tool design, due to the close limits demanded by the modern manufacture is the ability of the machine tool to stay put after setup on a certain operation. The outstanding achievements of the past year or two are the advancements made in the various types of grinding machines and the use of pneumatic and hydraulic feeding mechanisms."

Designs Are Affected

In a paper, "The Development of Machine Tools from a User's Viewpoint," F. C. Spencer, assistant superintendent of manufacturing development, Western Electric Co., Chicago, states that the standards adopted by his company affect the designs of machines with regard to both their economic and humanitarian aspects. The standards which machines must meet are as follows: 1.—Minimum floor space requirement; 2.—Elimination of accident hazards as far as possible by properly designed guards; 3.—Reduction of physical effort by the provision of convenient operating arrangement; 4.—Cleanliness, secured by preventing machines and cutting lubricants from leaking or being thrown from the machine; and 5.—Appearance.

Mr. Spencer says it is claimed that hydraulic feeds make possible higher cutting speeds and longer tool life; but whether or not this is true, there are advantages sufficient to justify the adoption of the hydraulic method of operation wherever possible. He states also that we would do well to encourage the design of more semi-automatic production machinery for specific operations. Machines should be provided with safety guard even

In 1927 several milling machines adopted antifriction bearings for the spindles. The above illustration shows a roller bearing spindle for a geared head lathe

though the cost is increased. Accomplishment in developments in the design of machines for manufacturing small parts will be expedited if the builder and user will work together closely.

Representing a user of machine tools, D. A. Wallace, John Deere Tractor Co., Waterloo, Iowa, says:

"In the development of the manufacturing industry, overhead has become a great factor and this overhead has become an increased burden, because of improper design and manufacture of machine tools. The machine tool designers as a whole have not recognized modern developments brought principally by the requirements of the automotive industry and have persistently insisted that their designs were the last word.

"It was early demonstrated in the automotive industry that babbitt bearings and other metallic solid bearings would not stand up in the transmissions and rear axles of automobiles, yet at no time are these bearings as a whole called upon to carry the loads continuously as they are in machine tools. Little pressure was brought to bear upon machine tool manufacturers to improve their product as the public forced the automotive industry to improve its product."

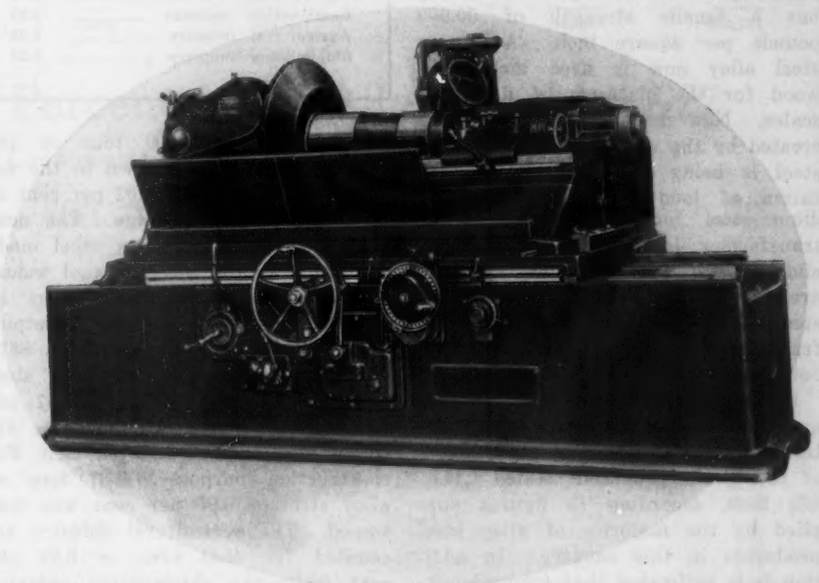
Mr. Wallace presented a list of 16 requirements which a production plant seeks in a machine tool but space does not permit its reproduction here. In commenting on this list he says:

"This may not cover all of the points, but what is required in a manufacturing plant are machines so built that they are brought back to their original alignment by the replacement of parts so designed that they do not require fitting by a skilled mechanic."

Expositions Show Progress

Quoting further, Mr. Wallace says:

"The machine tool exposition at Cleveland showed a very great improvement. At the first Cleveland exposition, machine tools were just an aggregation of all different designs. The next exposition in Chicago showed great improvements in the appearance of machine, better finishes, more stream lines, smooth contours and less recess depression, making the machines easier to clean. The last exposition brought out a great many new designs, still better finishes, simpler controls and big improvements from every standpoint."



Improved lubricating systems have been incorporated in all types of machine tools. This special grinder for finishing machine tool spindles features forced feed lubrication for the tableway

Recession in Alloy Steel Output in 1927 Is Slight

ALLOY steels are being increasingly employed and the application in this direction will continue to enlarge as metallurgists develop their properties and demonstrate their reliability and economic advantages.

Noncorroding chromium steels during the year just closed have been improved by the addition of a fairly high amount of nickel and the chemical industry is recognizing more and more the advantage of equipment made of this quality of steel in the way of complete resistance to chemical agents. The utility of such equipment is demonstrated in the manufacture and mixing of acids and in the roasting and treating of ores. Pump impellers, fans for exhausting gas, acid handling pumps, salt vats and tanks used in the dyeing industry are only a few of the many recent applications of special grade steels.

Fuselage Made of Tubing

One of the most recent developments in this steel is the alloy steel tubing used in the fuselage of modern airplanes. The steel from which the tubing is manufactured contains chromium and molybdenum. Heat treating the tubing during the manufacture and fabrication imparts a tensile strength of 90,000 pounds per square inch. Ordinary steel tubing has a tensile strength of 50,000 pounds per square inch. A copper steel alloy now is used instead of wood for the platform of floor-type scales. New demands also are being created by the radio industry. Chrome steel is being utilized in the fabrication of loud speakers and vanadium steel for the magnets. The transformer laminations, pole pieces and armatures in cone-type speakers are manufactured from high silicon steel. Yoke riveters with the truss frame built of alloy steel now are being marketed.

During 1927 steel ingots of alloy quality produced in this country totaled 931,947 tons. In 1926 ingots of this grade produced totaled 1,111,102 tons, according to figures supplied by the majority of alloy steel producers in this country. In addition it is estimated that approximately 1,000,000 tons of alloy steel was used for rust-resisting purposes.

Of the various rolled alloy steel commodities shipped by producers in 1927, 76 per cent was in the form of hot-rolled bars. Of the remaining portion of alloy steel commodities produced in 1927, 7 per cent was in the form of cold-drawn bars, 6.6 per cent was pipe and tubes, 3.2 forgings, 2.3 per cent tool steel, 1.5 wire, 1.4 per cent hot strip, 1.1 per cent sheets, and the remainder in structural material, merchant shapes and cold-rolled strip steel.

The heaviest consumer of alloy steel is the automotive industry. During 1927, it used 375,909 tons of the various commodities shown in the accompanying table or 75.07 per cent of the total finished tonnage. The next largest consumer of alloy steel made in 1927 was the machine tool industry which absorbed 25,313 tons or 4.73 per cent of the 1927 output. The railway industry consumed 8874 tons or 1.77 per cent. Alloy steel exported was 7857 tons or 1.57 per cent. The oil producing industry absorbed 6267 tons or 1.25 per cent. For construction purposes, 4737 tons of alloy steel or 0.95 per cent was consumed. The agricultural industry accounted for 4041 tons or 0.89 per cent while the shipbuilding industry consumed 1757 tons or 0.35 per cent of the various alloy steel commodities produced in 1927 in the United States.

High Lights of Alloy Steel Industry

	Per cent
National output processed into:	
Hotrolled bars	75.62
Cold drawn bars	7.06
Pipe and tubes	6.60
Forgings	3.20
Tool steel	2.25
Wire	1.50
Hot rolled strip	1.38
Sheets	1.11
Plates	0.96
Structural	0.16
Merchant shapes	0.11
Cold rolled strip	0.05
Consumed by:	
Automotive industry	75.07
Miscellaneous	13.17
Machine tool industry	4.73
Railroad industry	1.77
Export trade	1.57
Oil industry	1.25
Construction industry	0.95
Agricultural industry	0.89
Shipbuilding industry	0.35

Data obtained from various manufacturers of alloy steel in this country disclose that in 1927 the automotive industry consumed 305,649 tons or 80.73 per cent of all the hot-rolled bars produced by alloy steelmakers. The machine tool industry purchased 8937 tons or 2.36 per cent. Hot-rolled bars exported amounted to 6917 tons or 1.83 per cent of the tonnage produced. The railroad industry purchased 6008 tons or 1.59 per cent and the oil industry 5583 tons or 1.48 per cent of the 1927 output of hot-rolled bars. The automotive industry also accounted for 26,786 tons or 75.75 per cent of all the alloy cold-drawn bars made in 1927. The machine tool industry accounted for 5270 tons or 14.90 per cent of the total tonnage produced. The next largest user of this commodity was the agricultural industry which absorbed 238 tons or 0.67 per cent.

Includes Certain Grades

The 5578 tons of sheets recorded in the accompanying table includes only the tonnage fabricated into the transformers, dynamos, armatures, etc., and does not take into consideration the million tons or more of alloy bearing sheets which are produced in this country annually for protective purposes.

Plates shipped by alloy steelmakers during 1927 amounted to 4733 tons. Of this amount 1554 tons or 32.8 per cent was used for construction purposes. The oil industry consumed 352 tons or 7.43 per cent, the automotive industry 186 tons or 3.93 per cent, the machine tool industry 80 tons or 1.70 per cent while 2 tons were exported.

The automotive and airplane industries absorbed 30,090 tons of pipe and seamless tubes and also accounted for 3937 tons of alloy steel wire out of a total of 7538 tons produced in 1927. Of the 799 tons of structural shapes rolled during 1927, the automotive industry consumed 28 tons, the machine tool industry 14 tons, the building industry 533 tons while 224 tons was used for miscellaneous requirements. Over 36 per cent of the merchant shapes produced in 1927 was absorbed by the automotive industry.

Hot-rolled strip steel of alloy qual-

ity made during 1927 was put to the largest use by the automotive industry. Of the 6889 tons made during the year just closed, 4515 tons or 65.54 per cent found its way to the automotive industry. The agricultural industry used 1475 tons or 21.41 per cent of this commodity; the machine tool industry 570 tons or 8.26 per cent; the building industry 29 tons or 0.43 per cent; and 4.36 per cent is credited to miscellaneous applications. The machine tool industry, in addition, absorbed 250 tons of cold-rolled strip steel of alloy quality.

Alloy tool steel manufactured in 1927 totaled 11,296 tons or 2.25 per cent of 1927 alloy steel shipments. Approximately 5411 tons or 47.90 per cent went to the machine tool industry; 2449 tons or 21.68 per cent to the automotive industry; 866 tons or 7.67 per cent to the railroad industry; 156 tons or 1.38 per cent to the shipbuilding industry; 132 tons or 1.17 per cent to the oil industry; 55 tons or 0.49 per cent to the agricultural industry; and 2227 tons or 19.71 per cent to miscellaneous requirements. Forgings of alloy quality produced during 1926 amounted to 16,044 tons. The output of this commodity going to the machine tool industry amounted to 3781 tons or 23.57 per cent; forgings used by the railroad industry amounted to 1988 tons or 12.39 per cent; those consumed by the automotive industry amounted to 1367 tons or 8.52 per cent; forgings exported claimed 752 tons or 4.69 per cent; those shipped to the shipbuilding industry amounted to 378 tons or 2.35 per cent while the demand for miscellaneous purposes was 7761 tons.

Alloy Steel Output in 1927 by Form

Commodity	Gross Tons
Ingots produced	931,947
Hot rolled bars	378,602
Cold drawn bars	35,361
Pipe and tubes	33,072
Forgings	16,044
Tool steel	11,296
Wire	7,538
Hot rolled strip	6,889
Sheets	5,578
Plates	4,733
Structural	799
Merchant shapes	559
Cold rolled strip	250

Those figures of ingots or finished tonage disregard sheets of which it is estimated about 1,000,000 tons additional of alloy bearing metal is produced for rust resisting and protective purposes.

Distribution in Tons of Output of Alloy Steel in 1927

Shown by Consuming Groups and Individual Products

	Hot rolled bars, gross ton	Cold drawn bars, gross ton	Sheets, gross ton	Plates gross ton	Pipe and tubes, gross ton	Wire, gross ton	Structural shapes, gross ton
1—Automotive industry	305,649	26,786	700	186	30,090	3,937	28
2—Machine tool industry	8,937	5,270	1,000	80	.....	.....	14
3—Railroad industry	6,008	12	.....	.....	.....	.....	.....
4—Agricultural industry	2,273	238	.....	.....	.....	.....	.....
5—Construction	335	7	2,263	1,554	.....	.....	533
6—Shipbuilding industry	1,213	10	.....	.....	.....	.....	.....
7—Oil industry	5,583	199	.....	352	.....	.....	.....
8—Exports	6,917	186	.....	2	.....	.....	.....
9—All other requirements	41,687	2,653	1,615	2,559	2,982	3,601	224
Totals	378,602	35,361	5,578	4,733	33,072	7,538	799

	Merchant shapes, gross ton	Hot rolled strip, gross ton	Cold rolled strip, gross ton	Tool steel, gross ton	Forgings, gross ton	Total gross ton
1—Automotive industry	202	4,515	.....	2,449	1,367	375,909
2—Machine tool industry	.....	570	250	5,411	3,781	25,313
3—Railroad industry	.....	.....	.....	866	1,988	8,874
4—Agricultural industry	.....	1,475	.....	55	.....	4,041
5—Construction	.....	29	.....	.....	16	4,737
6—Shipbuilding industry	.....	.....	.....	156	378	1,757
7—Oil industry	.....	.....	.....	132	1	6,267
8—Exports	.....	.....	.....	.....	752	7,857
9—All other requirements	357	300	.....	2,227	7,761	65,966
Totals	559	6,889	250	11,296	16,044	500,721

Distribution by Percentage of Alloy Steel in 1927

Shown by Consuming Groups and Individual Products

	Hot rolled bars, per cent	Cold drawn bars, per cent	Sheets, per cent	Plates, per cent	tubes, per cent	Wire, per cent
1—Automotive industry	80.73	75.75	12.55	3.93	90.98	52.23
2—Machine tool industry	2.36	14.90	17.93	1.70	.....	.....
3—Railroad industry	1.59	0.04	.....	.....	.....	.....
4—Agricultural industry	0.60	0.67	.....	.....	.....	.....
5—Construction	0.08	0.03	40.57	32.83	.....	.....
6—Shipbuilding industry	0.32	0.03	.....	.....	.....	.....
7—Oil industry	1.48	0.56	.....	7.43	.....	.....
8—Exports	1.83	0.52	.....	0.04	.....	.....
9—All other requirements	11.01	7.50	28.95	54.07	9.02	47.77
Totals	100.00	100.00	100.00	100.00	100.00	100.00

	Structural shapes, per cent	Merchant shapes, per cent	Hot rolled strip, per cent	Cold rolled strip, per cent	Tool steel, per cent	Forgings, per cent
1—Automotive industry	3.50	36.14	65.54	.....	21.68	8.52
2—Machine tool industry	1.75	.....	8.26	100.00	47.90	23.57
3—Railroad industry	.....	.....	.....	.....	7.67	12.39
4—Agricultural industry	.....	.....	21.41	.....	0.49	.....
5—Construction	66.71	.....	0.43	.....	.....	0.10
6—Shipbuilding industry	.....	.....	.....	.....	1.38	2.35
7—Oil industry	.....	.....	.....	.....	1.17	0.01
8—Exports	.....	.....	.....	.....	.....	4.69
9—All other requirements	28.04	63.86	4.36	.....	19.71	48.37
Totals	100.00	100.00	100.00	100.00	100.00	100.00

Steel Demand by Main Groups, 1922-1927

	1927		1926		1925		1924		1923		1922	
	Tonnage	Per cent of Total	Tonnage	Per cent of Total	Tonnage	Per cent of Total	Tonnage	Per cent of Total	Tonnage	Per cent of Total	Tonnage	Per cent of Total
Railroads	5,857,633	20.37	7,336,892	22.81	7,129,600	22.28	7,233,900	27.54	9,459,200	31.02	5,693,200	24.96
Building*	4,281,065	14.89	4,214,195	13.10	4,883,700	15.26	3,793,200	14.44	4,125,800	13.53	2,699,600	11.83
Oil, gas and water	2,559,082	8.90	2,986,888	9.29	2,569,800	8.03	2,218,200	8.43	3,232,800	10.60	3,384,500	14.84
Automotive	3,835,682	13.34	4,852,135	15.09	4,669,700	14.60	2,985,400	11.37	3,229,500	10.59	2,048,100	8.98
Exports	1,551,218	5.39	1,700,937	5.29	1,432,300	4.47	1,547,300	5.89	1,897,000	6.22	1,730,200	7.83
All others	10,669,721	37.11	11,071,433	34.42	11,313,700	35.36	8,491,900	32.33	8,551,600	28.04	7,199,100	31.56
Grand total	28,754,400	100.00	32,162,480	100.00	31,998,800	100.00	26,269,900	100.00	30,495,900	100.00	22,754,700	100.00

All years computed as 100 per cent of total capacity, based on returns from 98.01 per cent of steel ingot capacity for 1927; 93.32 per cent for 1926; 84.08 per cent for 1925; 81.90 per cent for 1924; 75.84 per cent for 1923, and 70.88 per cent for 1922.

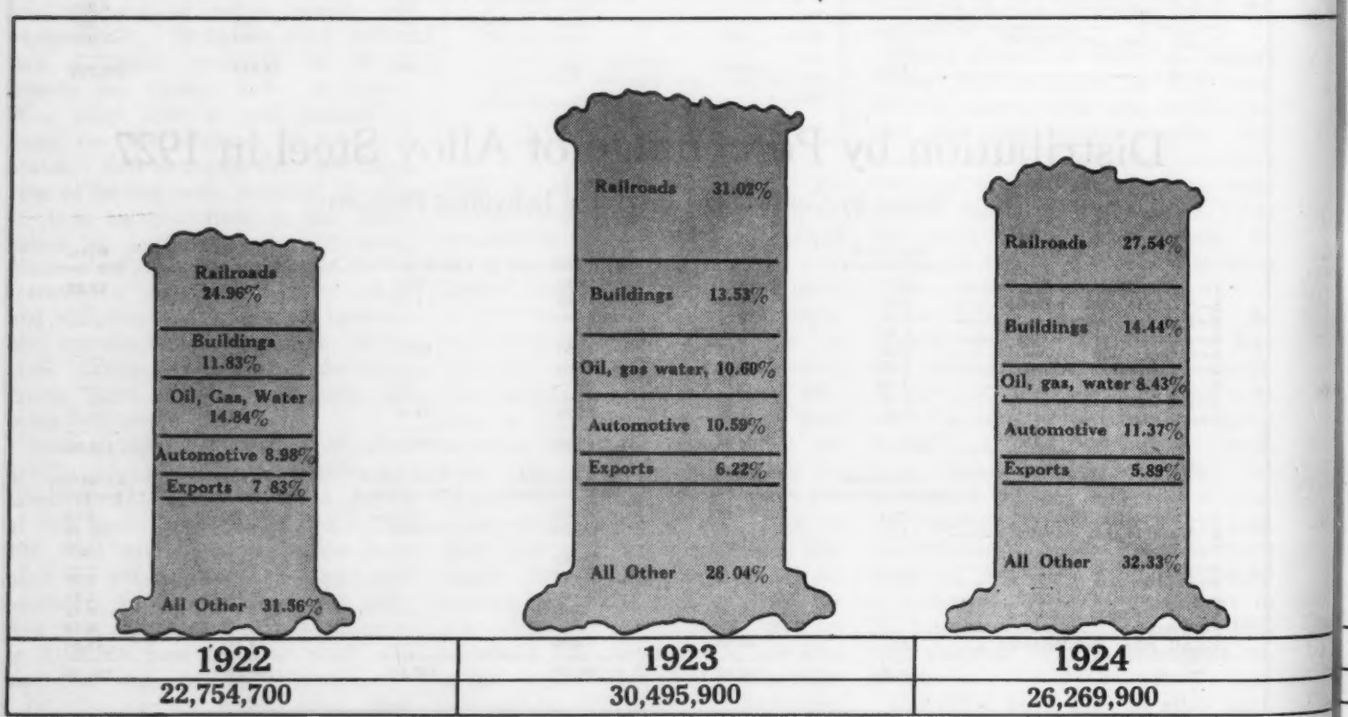
* Exclusive of railroad bridges and buildings.

Widening Sphere of Steel Consumption Marks 1927

BASED on returns to IRON TRADE REVIEW from 98.01 per cent of the steel ingot capacity of the United States, all finished steel shipments in 1927 totaled 28,754,400 tons. This shows a decrease from the 32,162,480 tons reported last year, computed from returns of 93.32 per cent of steel ingot capacity. Broadening application of steel to new uses was more pronounced in 1927, the leading consuming groups, the railroad, building, automotive and oil gas and water industries taking only 57.50 per cent of all finished steel shipments in 1927, as compared with 60.29 per cent in 1926, 60.17 per cent in 1925, 61.78 per cent in 1924, and 65.74 per cent in 1923.

All of the major consuming groups with the exception of building, registered a decrease in 1927 from 1926. Railroads continued the dominant factor, taking a total of 5,857,633 tons, or 20.37 per cent of all finished steel. This compares with 7,336,892 tons, or 22.81 per cent in 1926, and 7,129,600 tons, or 22.28 per cent in 1925. Buildings gained from 4,214,195 tons or 13.10 per cent in 1926 to 4,281,065 tons, or 14.89 per cent of the 1926 total.

Oil, gas and water consumers absorbed 2,559,082 tons of finished steel in 1927, or 8.90 per cent of all shipments. This compares with 2,986,888 tons and 9.29 per cent in 1926, and 2,569,800 tons and 8.03 per cent in 1925. Automotive needs dropped off considerably in 1927, accounting for only 3,835,682 tons, or 13.34 per cent of the country's total, as compared with 4,852,135 tons and 15.09 per cent in 1926. Exports remained practically stationary, taking 5.39 per cent of the finished steel shipments in 1927, as



compared with 5.29 per cent in 1926. General consuming lines, incorporating all other phases except the major groups just mentioned, took 10,669,721 tons, or 37.11 per cent, compared with 11,071,433 tons and 34.42 per cent in 1926. Further refinement of the classifications of IRON TRADE REVIEW were made this year in the segregation of concrete bars and galvanized sheets. Of the 461,278 tons reported by makers of concrete bars, 291,109 tons was shipped to the building industry and 115,313 tons was absorbed in construction of highways and bridges other than railroad. Warehouses accounted for the largest percentage of galvanized sheets, receiving 271,983 tons out of a total reported of 859,329 tons. The building industry was the next largest specific consumer, taking 156,199 tons.

The only products listed showing an increase in 1927 over 1926 were angle bars, black plates for tinning, and wire products. The increase in angle bar shipments was due to railroad track work, which took 858,198 tons in 1927 compared with 693,599 tons in 1926. Black plate increases were shown by the metal container, oil gas and water industries and by jobbers. Warehouses accounted for 693,600 tons of wire products in 1927 as against 542,854 tons in 1926.

Jobbers and the oil, gas and water industries accounted for the bulk of pipe shipments in 1927, the former handling 1,159,682 tons, compared with 1,039,375 tons in 1926, and the latter 1,599,994 tons, as against 1,756,967 tons in 1926.

A new consuming industry was introduced in this survey, in listing highway work and all other bridges as a classification separate from railroad buildings and bridges and general consumption. The highways and bridges required 291,081 tons in 1927, of which 115,313 tons was concrete bars, 58,111 tons black plate and sheets, and 34,647 tons structural shapes. Buildings formed the largest individual consuming group of the 16 classifications in the IRON TRADE REVIEW list. This group accounted for 14.88 per cent of the total tonnage reported. Structural shapes, with 1,781,396 tons, contributed the major part of the total consumption, plates being second with 580,881 tons. A total of 536,447 tons of bars also was consumed by the building industry. The automotive industry required 3,759,352 tons of finished steel in 1927, being the second most important individual consumer. Bars, amounting to 1,315,594 tons, was the individual product used most heavily in that industry, and formed 28.18 per cent of the total bar consumption. A total of 1,103,950 tons of sheets other than galvanized and black plate for tinning was consumed in the automotive industry.

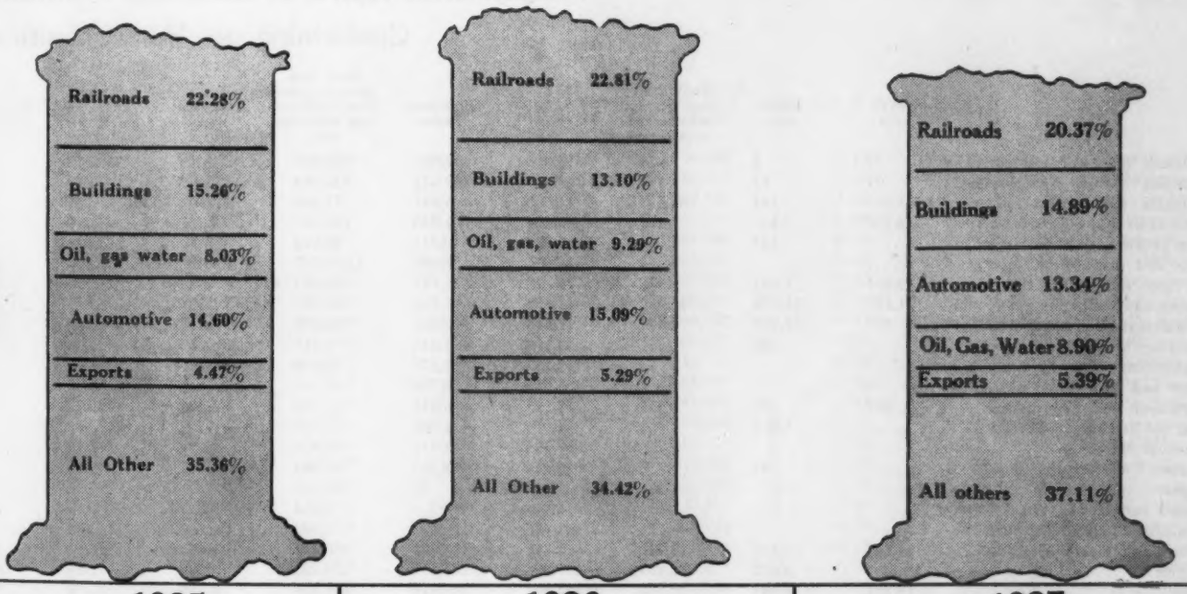
Warehouses handled 12.69 per cent of all finished steel in 1927, compared with 10.93 per cent in 1926, the most popular items being pipe, with 1,159,682 tons and wire products with 693,660 tons. Much of the wire

Consumption Analyses Authentic

GROWING interest in the annual analyses of finished steel consumption is reaching its fullest expression. Inaugurated in 1921 *by* IRON TRADE REVIEW, *and developed in subsequent years, the analysis in the current issue represents reports from* 106 *of the leading steel manufacturers and fabricators controlling* 98.01 *per cent of the steel ingot capacity of the United States.*

Further expansion in the classifications of IRON TRADE REVIEW *is marked this year by the addition of shipments to the roadbuilding and highway bridge construction industry. Galvanized sheets and concrete bars have been segregated from the general sheet and bar classifications, to illustrate more definitely the consumption of those products which are growing in importance.*

In addition to the IRON TRADE REVIEW *tabulation a table listing the division of shipments according to new classifications adopted by the United States Steel Corp. is presented. Variation in comparable listings in the two tables is due to the further refinements offered in the Steel corporation tabulation.*



1925	1926	1927
31,998,800	32,162,480	28,754,400

Distribution in Gross Tons of Finished Steel Output in

Compiled from reports of Companies Controlling 98.

	Heavy rails	Light rails	Angle bars, steel ties and other track accessories	Plates	Structural shapes	Bars and shapes under 3-inch, excepting concrete bars	Concrete bars	Hoops, bands, and cotton ties	Black plates for tinning
1—Railroad buildings and railroad bridges	71	13	1	82,431	155,351	110,550	13,226	2,629	.....
2—Highway work and all other bridges	9	8	2	30,233	34,647	16,958	115,313	.....	.....
3—All other buildings	3,638	900	264	580,881	1,781,396	536,447	291,109	46,274	22,715
4—Railroad track work	2,291,347	1,989	858,198	15,008	766	56,486	.....	168	.....
5—Street railways	50,426	34	8,513	2,931	6,011	26,049	.....	91	.....
6—Automotive vehicles	.....	7	53	158,745	29,510	1,315,594	.....	321,294	33,433
7—Railroad cars and locomotives	52	4	34	664,630	234,513	433,540	.....	10,683	.....
8—Oil, gas and water requirements	2,485	1,783	949	530,698	49,084	78,366	.....	13,736	61,130
9—Mining and Lumbering	21,177	106,992	16,061	16,215	15,532	38,587	725	5,953	.....
10—Agricultural equipment	599	166	134	33,788	10,061	579,414	.....	26,279	313
11—Metal containers	.....	.....	.....	15,290	1,223	4,319	.....	65,819	1,205,463
12—Shipbuilding	.....	.....	4	135,548	35,579	33,300	.....	210	.....
13—Machinery and hand tools	593	1,018	124	190,358	78,550	389,949	.....	16,687	.....
14—Exports	151,364	5,612	22,875	172,247	201,821	133,982	990	17,934	269,295
15—Jobbers and Warehouses	21,247	9,563	13,382	136,590	216,212	454,374	39,915	41,262	54,709
16—All other requirements	15,594	4,546	12,244	124,863	137,361	460,565	.....	79,254	64,835
Totals	2,558,602	132,635	932,838	2,890,456	2,987,617	4,668,480	461,278	648,273	1,711,893

product tonnage handled consisted of wire nails and other manufactures of wire.

Railroad track work, consisting almost entirely of heavy steel rails and angle bars, was the fourth largest consuming group, taking 3,271,299 tons. Rails accounted for 2,291,347 tons of that total, with angle bars, steel ties and other track accessories furnishing 858,198 tons toward the total.

The United States Steel Corp. in the past year adopted a new form of finished steel consumption tabulation, and IRON TRADE REVIEW has compiled data for the entire industry on this new basis, the tables for which are presented here. Further segregations of ultimate consuming lines were made in this tabulation, the new listings being: Fabricators and building contractors, building hardware and trim companies, boiler and tank manufacturers, bolt, nut and rivet makers, electrical manufacturers, concrete reinforcing companies, forgers, pressed and formed metal manufacturers and furniture and stove makers.

Of the new listings in the Steel corporation tabulation, fabricators and building contractors took 3,108,121 tons or 11.04 per cent of the total, building hardware and trim companies 201,582 tons or 0.72 per cent, boiler and tank manufacturers 586,770 tons or 2.09 per cent, bolt, nut and rivet makers 499,268 tons or 1.78 per cent and electrical manufac-

Distribution in Gross Tons of Finished Steel Output in

Compiled from reports of Companies Controlling 98.

Conforming to New Classifications

	Heavy rails	Light rails	Angle bars, steel ties and other track accessories	Plates	Structural shapes	Bars and shapes under 3-inch, excepting concrete bars	Concrete bars	Hoops, bands, and cotton ties	Black plates for tinning
1—Railroads (cars and locomotives)	52	4	34	575,306	221,085	385,395	.....	10,725	.....
2—Railroads (bldgs. and bridges)	71	13	1	105,488	169,631	112,984	6,195	2,637	.....
3—Railroads (track work)	2,235,713	244	866,399	15,008	5,845	31,108	.....	209	.....
4—Fabricators and bldg. contractors	6,950	2,123	462	565,404	1,781,520	268,792	78,335	5,285	1,103
5—Bldg. hardware and trim companies	.....	528	.....	2,886	18,733	48,938	.....	15,621	1,071
6—Auto and part Mfrs.	.....	.....	53	215,606	29,500	1,211,559	.....	321,290	28,123
7—Oil, gas and water companies	2,451	1,682	946	215,797	26,787	65,673	.....	13,390	61,130
8—Mining and lumbering companies	21,177	54,338	16,061	14,357	15,532	32,587	725	5,953	.....
9—Agricultural Mfrs. and distributors	599	52,739	134	43,646	10,061	545,936	.....	26,279	313
10—Container Makers	.....	166	.....	14,290	1,223	4,319	10,000	65,819	1,198,463
11—Shipbuilding	.....	.....	4	133,283	35,579	32,300	.....	210	.....
12—Boiler and tank Mfrs.	34	.....	3	453,086	50,528	21,149	.....	808	.....
13—Machinery and tool makers	593	23	124	48,583	46,635	321,550	.....	15,422	.....
14—Bolt, nut and rivet makers	.....	1,018	8	1,019	1,001	401,694	.....	2,582	.....
15—Electrical Mfrs.	.....	.....	.....	17,395	4,324	15,926	.....	5,776	217
16—Concrete reinforcing companies	.....	36	8	10,018	5,503	14,904	341,261	7,000	....
17—Forgers	.....	.....	.....	3,209	76	116,242	.....	44	....
18—Pressed and formed metal Mfrs.	.....	.....	.....	11,840	.....	1,644	.....	.....	30,581
19—Furniture and stove makers	.....	.....	.....	1,596	593	7,672	.....	18,846	2,053
20—Jobbers and Warehouses	21,247	9,563	13,382	164,841	274,002	410,827	15,452	41,262	54,709
21—Exports	151,364	5,612	22,875	153,996	144,031	133,982	990	17,934	269,295
22—Miscellaneous	18,351	4,546	12,344	112,802	145,428	436,409	8,289	71,181	64,835
Totals	2,558,602	132,635	932,838	2,890,456	2,987,617	4,668,480	461,278	648,273	1,711,893

1927 Shown by Consuming Groups and Individual Products

01 Per Cent of Ingot Capacity in the United States

All other black plate and sheets, excepting galvanized sheets	Galvanized sheets	Tubing and pipe	Wire products	Strip steel	All other finished steel products	Grand Totals, all finished products	Per cent of Total 1927	Per cent of Total 1926	
23,794	4,423	773	41,311	1,000	35,590	471,163	1.67	2.91	Railroad buildings and railroad bridges—1
58,111	2,572	113	17,508	15,540	67	291,081	1.03	13.10	Highway work and all other bridges—2
324,218	156,199	165,109	100,018	137,922	48,782	4,195,872	14.88		All other buildings—3
.....	.....	289	32,973	.....	14,075	3,271,299	11.61	11.73	Railroad track work—4
86	.....	1,554	3,308	.....	41,143	140,146	0.49	0.58	Street railways—5
1,103,950	5,886	58,960	131,643	477,437	122,840	3,759,352	13.33	15.09	Automotive vehicles—6
154,976	50,125	54,269	17,128	2,748	235,756	1,858,458	6.60	7.59	Railroad cars and locomotives—7
100,051	23,911	1,599,994	21,513	380	24,076	2,508,156	8.92	9.29	Oil, gas and water requirements—8
15,912	2,531	4,525	20,408	.....	11,552	276,170	0.98	0.87	Mining and Lumbering—9
44,961	32,795	3,211	450,700	14,961	21,710	1,219,092	4.33	2.69	Agricultural equipment—10
124,043	8,370	8,834	29,529	12,502	.....	1,475,392	5.24	5.24	Metal containers—11
6,895	20	3,573	2,933	108	9,812	227,982	0.81	0.65	Shipbuilding—12
10,607	.....	26,381	26,609	9,697	36,487	787,060	2.79	2.65	Machinery and hand tools—13
96,567	118,276	182,477	117,597	871	28,441	1,520,349	5.39	5.29	Exports—14
328,980	271,983	1,159,682	693,660	63,451	70,083	3,575,093	12.69	10.93	Jobbers and Warehouses—15
529,545	182,238	135,177	533,509	203,520	122,271	2,605,522	9.24	11.39	All other requirements—16
2,922,696	859,329	3,404,921	2,240,347	940,137	822,685	28,182,187	100.00	100.00	Totals

turers 243,327 tons or about 0.87 per cent.

Concrete reinforcing companies consumed 392,100 tons or 1.40 per cent, forgers 121,272 tons or 0.44 per cent.

Pressed and formed metal manufacturers took 237,775 tons or 0.85 per cent and furniture and stove makers 236,928 tons also 0.85 per cent of the total.

The bulk of furniture and stove consumption was furnished by black sheets with a total of 139,540 tons.

Plates furnished 453,086 tons in the manufacture of boilers and tanks. These fabricators also used 50,528 tons of structural shapes and 21,149 tons of bars.

Building hardware and trim manufacture required a total of 48,938 tons of bars, 15,621 tons of hoops and bands, 27,785 tons of black plate and sheets and 11,357 tons of galvanized sheets.

A decline in the quantity of semifinished steel materials shipped by mills to other companies for further fabrication was noted during 1927. The only product to register a gain was sheet and tin plate bars, of which 1,177,162 tons was shipped in 1927, as compared with 1,078,304 tons in 1926. Following are further comparisons of semifinished steel shipments:

Product	1927	1926
Billets and slabs	1,151,089	1,252,255
Sheet and tin bars	1,177,162	1,078,304
Wire rods	470,002	613,812
Skelp	466,219	608,031

1927 Shown by Consuming Groups and Individual Products

01 Per Cent of Ingot Capacity in the United States

Adopted by United States Steel Corp.

All other black plate and sheets, excepting galvanized sheets	Galvanized sheets	Tubing and pipe	Wire products	Strip steel	All other finished steel products	Grand Totals, all finished products	Per cent of Total	
152,498	50,125	64,269	14,354	2,748	244,285	1,720,880	6.12	Railroads (cars and locomotives)— 1
23,794	4,423	1,494	22,835	1,000	35,657	486,223	1.73	Railroads (bldgs. and bridges)— 2
64	.....	1,235	32,973	5,000	46,686	3,340,484	11.88	Railroads (track work)— 3
92,815	108,914	50,412	66,087	31,218	48,701	3,108,121	11.04	Fabricators and bldg. contractors— 4
27,785	11,357	228	28,451	45,972	12	201,582	0.72	Bldg. hardware and trim companies— 5
1,053,160	5,886	49,455	129,673	454,437	122,840	3,621,582	12.85	Auto and part Mfrs.— 6
80,538	21,345	1,591,994	21,513	380	24,076	2,127,702	7.47	Oil, gas and water companies— 7
7,912	2,531	4,600	19,408	.....	11,552	206,733	0.74	Mining and lumbering companies— 8
44,961	32,795	3,136	443,450	14,961	21,710	1,240,720	4.42	Agricultural Mfrs. and distributors— 9
124,043	8,370	501	29,243	12,788	.....	1,469,225	5.23	Container Makers—10
1,895	20	3,573	2,933	108	9,812	219,717	0.79	Shipbuilding—11
41,345	2,608	16,333	166	.....	710	586,770	2.09	Boiler and tank Mfrs.—12
10,607	.....	30,075	26,499	9,667	35,719	545,497	1.94	Machinery and tool makers—13
35	.....	234	89,919	26	1,732	499,268	1.78	Bolt, nut and rivet makers—14
105,752	1,769	74,254	1,441	16,415	58	243,327	0.87	Electrical Mfrs.—15
1,901	.....	14	10,153	1,301	1	392,100	1.40	Concrete reinforcing companies—16
.....	.....	1,306	370	.....	25	121,272	0.44	Forgers—17
94,259	24,195	2,660	2,519	70,077	.....	237,775	0.85	Pressed and formed metal Mfrs.—18
139,540	10,470	13,737	27,384	15,037	.....	236,928	0.85	Furniture and stove makers—19
328,980	271,983	1,179,682	693,720	63,451	70,083	3,613,225	12.82	Jobbers and Warehouses—20
96,567	118,276	182,477	117,597	846	28,441	1,444,283	5.14	Exports—21
493,645	184,262	123,747	460,019	194,675	120,585	2,451,118	8.83	Miscellaneous—22
2,922,696	859,329	3,404,921	2,240,347	940,137	822,685	28,182,187	100.00	Totals

Output of Steel Castings Grows, But Capacity Outdistances Demand

Proportion of Bookings to Capacity Declining

By William J. Corbett

STEEL castings are manufactured in the United States by 293 individual plants, which are operated by 267 companies. The total practical capacity is 198,863 net tons of good castings per month, or 2,386,356 per year.

Approximately 9 per cent of this total represents the steel foundry capacity of companies that manufacture steel castings exclusively for their own use as distinguished from those that sell their products to the consuming industries. In addition there are other companies operating steel foundries all of whose castings are not sold direct to consumers. Companies engaged in the manufacture of heavy machinery and also some of the large steel mills manufacture steel castings for their own use. However, the capacity of the steel foundries operated in this manner as separate departments of these large corporations, is sometimes greater than necessary for the manufacture of castings for their own use, and consequently the surplus foundry capacity is used to make steel castings sold in the open market in competition with foundries specializing only in the manufacture of steel castings.

The curves in Fig. 1 were constructed from data published annually by the American Iron and Steel institute. No data for the year 1927 are yet available, but it can be estimated that the total production of steel castings last year was below that in 1926. This diagram shows the history of the production of steel castings since 1910.

The curve of annual total production of steel castings clearly indicates a marked increase in the use of steel castings. The average increase is about 50 per cent since 1910.

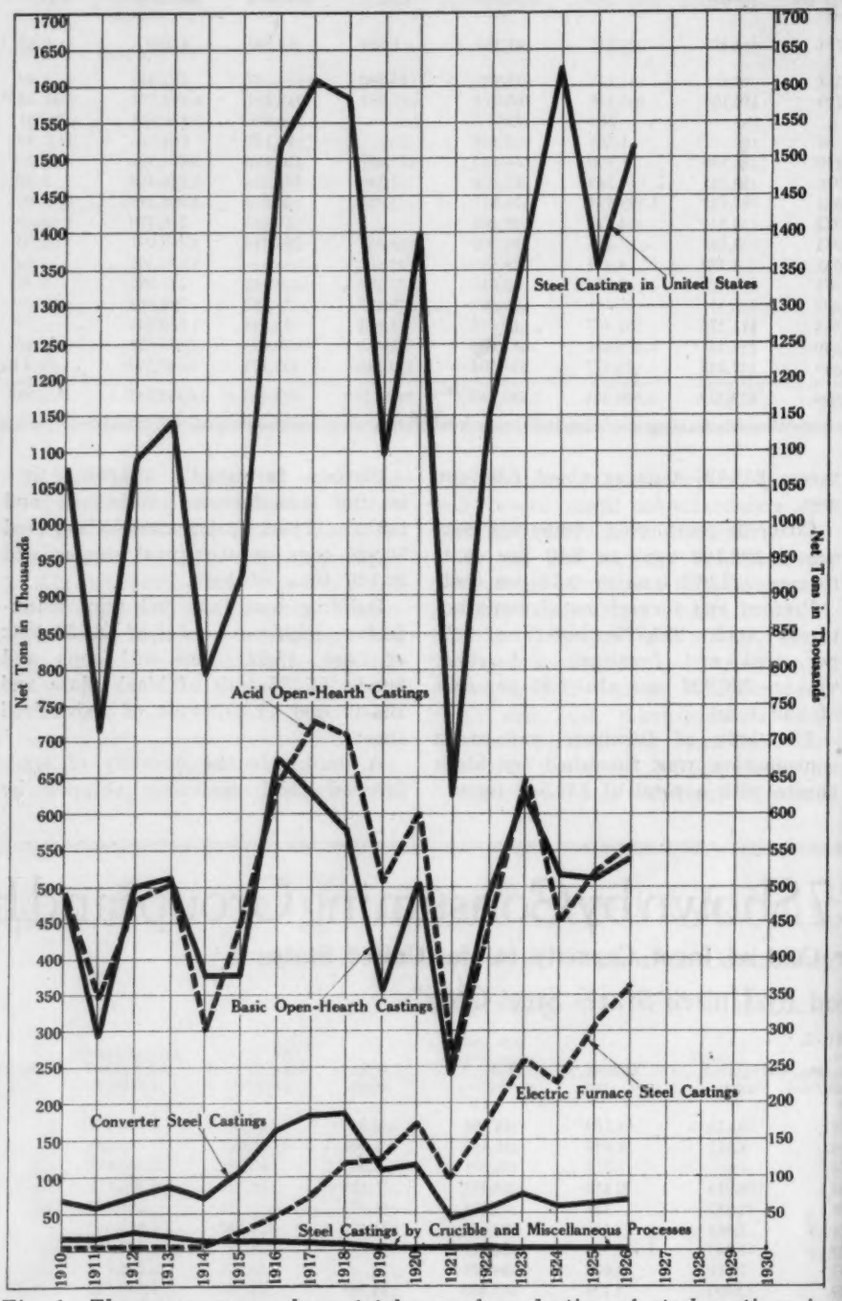


Fig. 1—The upper curve shows total annual production of steel castings in the United States. The others show production of basic and acid open-hearth, converter, electric, crucible and miscellaneous steel castings as indicated

Despite this rapid growth in the consumption of steel castings, the capacity of the industry has increased even more rapidly. Existing facilities for producing steel castings have been made more effective and this condition along with the new steel foundry capacity created during and since the war, have caused the total steel foundry capacity of the country to be much in excess of the total amount of steel castings the industries of the country consume. Therefore, further increase in steel foundry capacity would be economically un-

(*Concluded on Page* 60)

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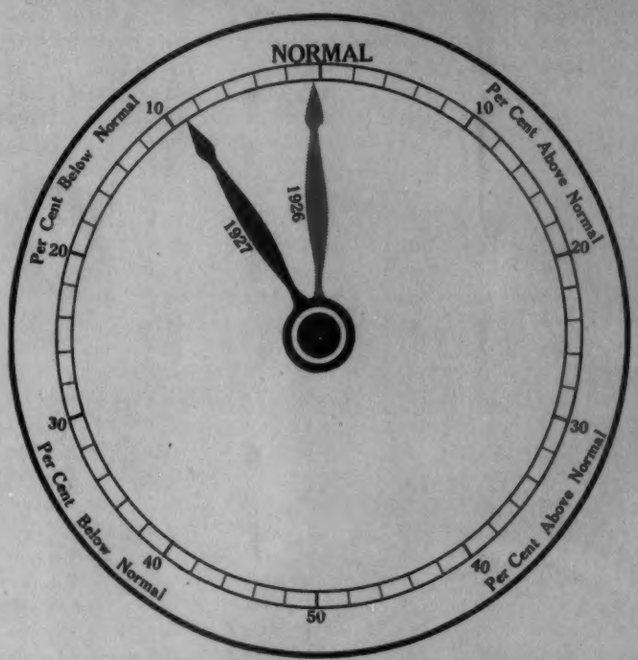
The Business Trend

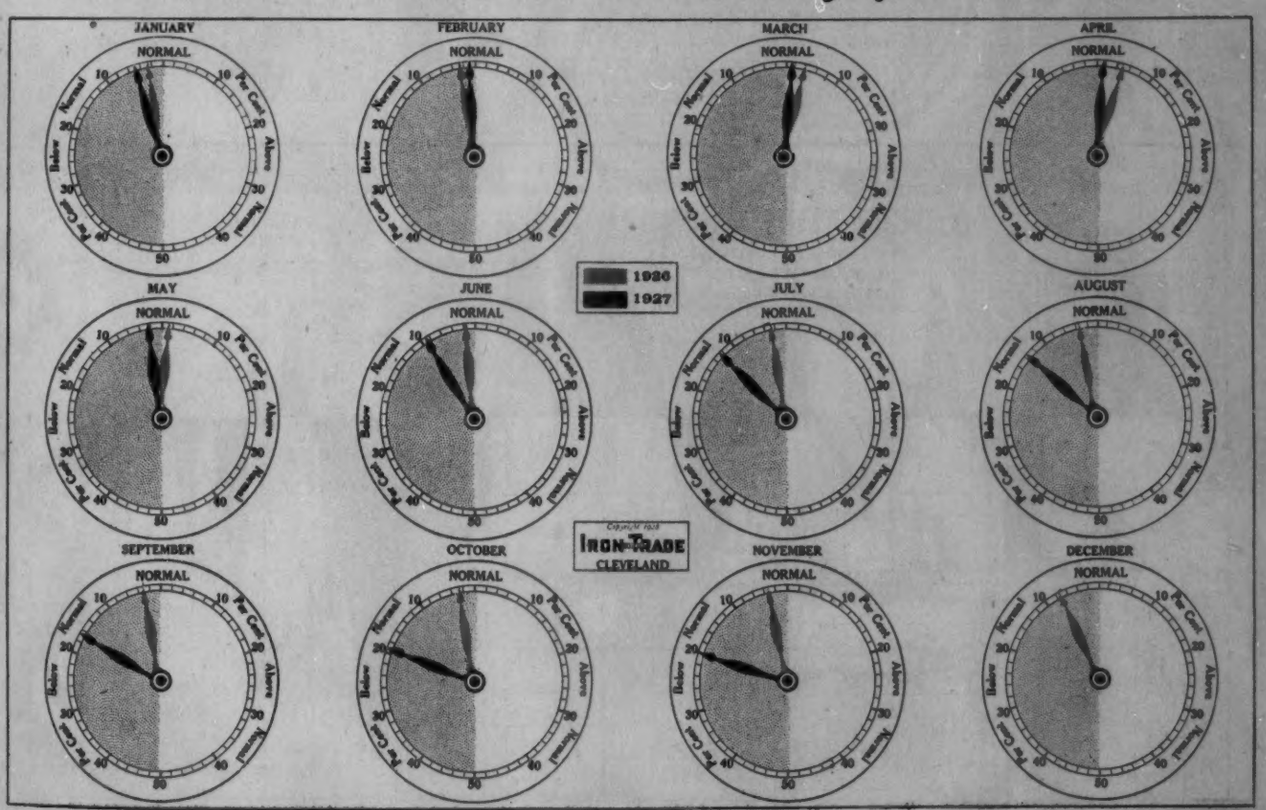
Blast Furnace Business Dial

The Dial represents the Blast Furnaee Index of Business which is based upon a 40-year record of furnace activity. It is regarded as an indicator of general industrial operations in the country.



When 60 per cent of all the country's furnaces are in blast business conditions are normal. The hands on the Dial represent the monthly average for 1926 and 11 months average for 1927.

Blast Furnace Index Monthly for 1927

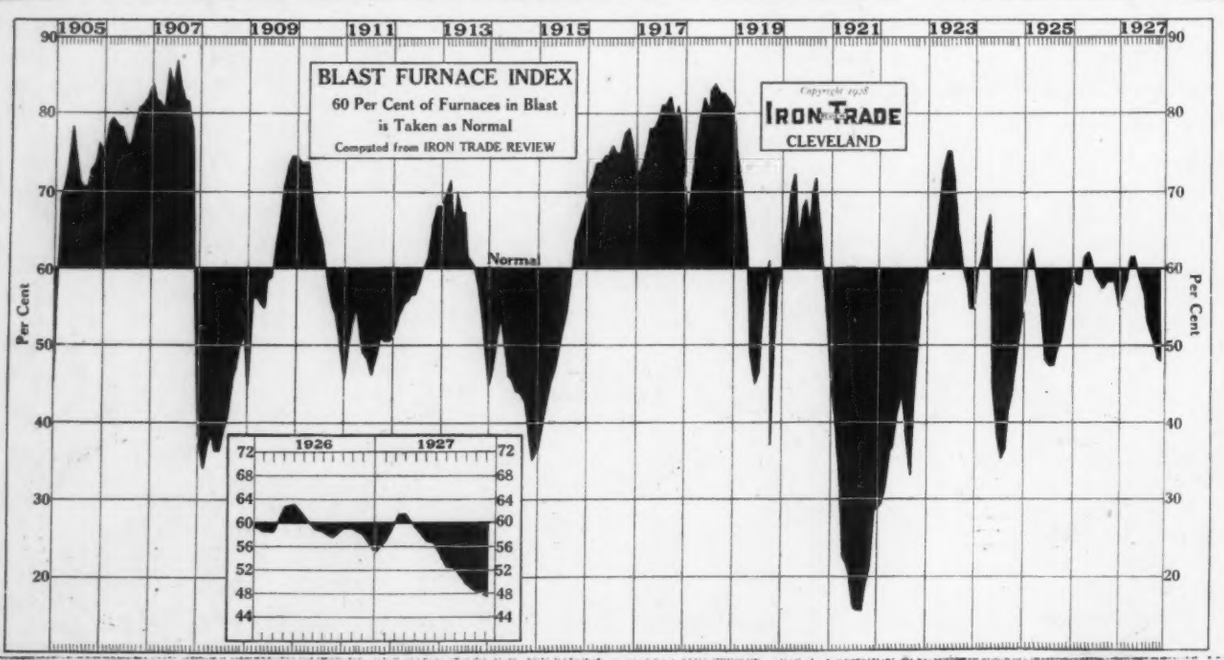


PER CENT OF FURNACES ACTIVE

Computed From IRON TRADE REVIEW, January, 1896, to Date

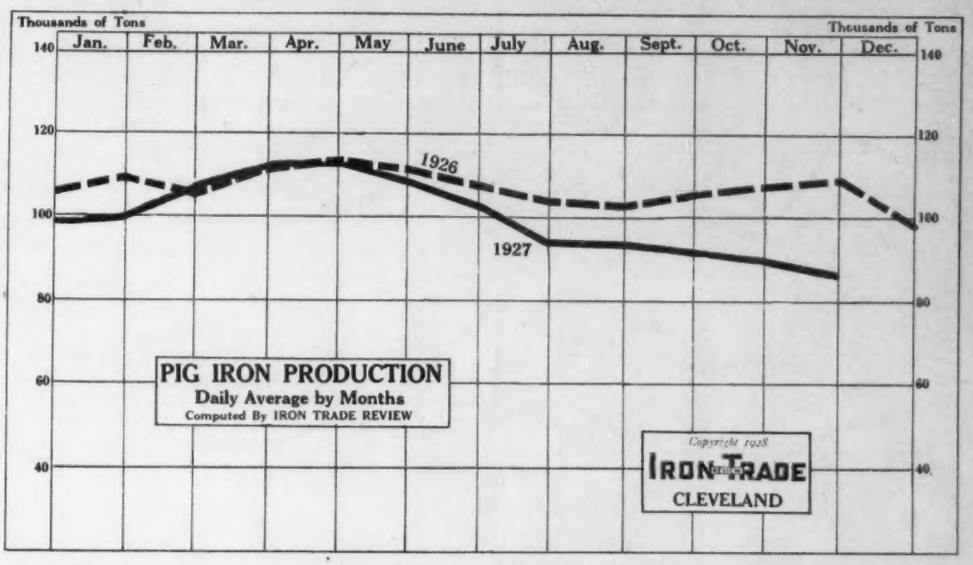
	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Average
1927.....	56.9	59.0	61.1	60.7	58.1	54.7	52.5	52.2	50.0	48.2	47.7	....	*54.4
1926.....	58.5	58.5	62.4	63.0	60.9	59.1	58.4	57.8	58.2	58.5	58.0	55.0	59.0
1925.....	61.0	62.3	60.0	54.0	48.5	47.9	47.5	49.2	51.6	54.1	57.2	59.5	54.4
1924.....	60.0	63.6	65.6	57.1	45.7	38.6	35.5	36.5	42.3	44.2	49.7	55.6	48.7
1923.....	61.1	65.6	69.6	73.4	76.0	76.0	71.5	64.5	60.7	58.6	55.2	55.2	65.6
1922.....	29.6	32.4	36.1	37.5	41.0	44.7	39.8	33.5	44.2	51.0	56.4	59.2	42.1
1921.....	42.1	35.5	23.6	22.0	20.6	16.9	15.9	15.8	19.3	21.9	28.0	28.7	24.2
1920.....	65.8	70.5	72.8	64.2	68.6	69.8	66.9	70.4	72.9	66.7	58.7	46.5	66.1
1919.....	75.9	71.5	64.2	49.7	45.5	46.0	55.2	61.4	37.7	49.9	58.2	60.5	56.3
1918.....	67.6	73.4	77.1	80.4	82.4	80.8	83.4	84.6	83.0	83.4	82.4	80.7	79.1
1917.....	73.5	75.1	78.1	78.3	79.9	81.2	81.8	82.8	79.3	81.8	79.1	73.8	78.7
1916.....	72.4	74.3	74.7	75.8	75.8	76.7	75.5	75.8	77.9	78.4	76.6	73.2	76.4
1915.....	39.3	42.6	45.2	46.9	49.3	52.6	55.7	58.5	63.3	65.7	67.8	70.2	54.7
1914.....	47.0	51.7	54.8	50.2	46.9	45.7	44.3	44.3	42.7	38.4	35.7	36.7	44.9
1913.....	70.1	72.2	65.6	70.7	67.8	67.1	62.6	61.4	60.6	57.3	53.1	45.1	62.9
1912.....	54.0	55.7	56.4	56.9	57.3	57.1	58.1	60.2	62.6	66.4	68.2	68.7	60.1
1911.....	50.0	53.8	56.2	52.4	49.0	48.1	46.3	48.6	51.0	50.9	50.9	51.0	50.7
1910.....	74.6	74.6	74.4	69.5	66.7	64.5	60.5	57.8	55.7	54.7	51.9	45.9	62.5
1909.....	57.6	57.3	56.3	55.1	58.1	58.8	63.0	67.6	71.9	74.8	75.3	75.4	64.2
1908.....	34.9	37.3	38.7	36.6	36.7	39.0	41.8	45.4	47.4	50.0	52.8	43.8	43.0
1907.....	82.7	82.2	80.6	86.7	84.2	87.0	84.8	82.9	82.6	78.2	56.7	38.7	77.2
1906.....	78.4	79.8	79.0	78.4	78.4	76.9	76.8	78.3	80.9	81.7	82.2	84.2	79.6
1905.....	69.7	70.5	74.8	78.6	75.9	72.1	71.3	71.3	73.7	73.9	76.6	75.8	73.6
1904.....	52.7	57.2	61.8	64.2	59.5	52.5	45.7	51.0	52.8	53.6	59.3	64.6	56.2
1903.....	83.3	84.3	84.4	84.2	84.0	79.0	76.2	76.2	72.7	60.4	51.8	43.7	73.3
1902.....	72.6	76.7	76.1	78.1	79.4	79.3	78.9	77.7	81.0	76.2	74.2	78.6	79.0
1901.....	62.2	66.3	68.9	69.9	72.4	72.3	70.7	73.2	72.8	68.4	72.7	73.3	70.2
1900.....	78.8	82.8	82.8	82.6	83.6	82.9	78.7	64.5	60.6	56.0	52.6	55.1	71.7
1899.....	60.0	59.4	58.3	62.1	65.3	67.0	71.3	73.7	74.1	77.5	79.0	80.8	69.0
1898.....	51.9	51.4	53.5	54.2	54.6	52.4	52.9	52.4	52.8	55.6	57.1	58.5	54.0
1897.....	37.1	37.4	38.9	38.8	37.2	37.0	36.3	36.3	40.2	44.9	48.2	50.3	40.7
1896.....	70.0	64.4	60.8	61.5	61.2	59.0	58.0	50.3	41.1	35.2	31.5	35.1	52.3

*Eleven months average.

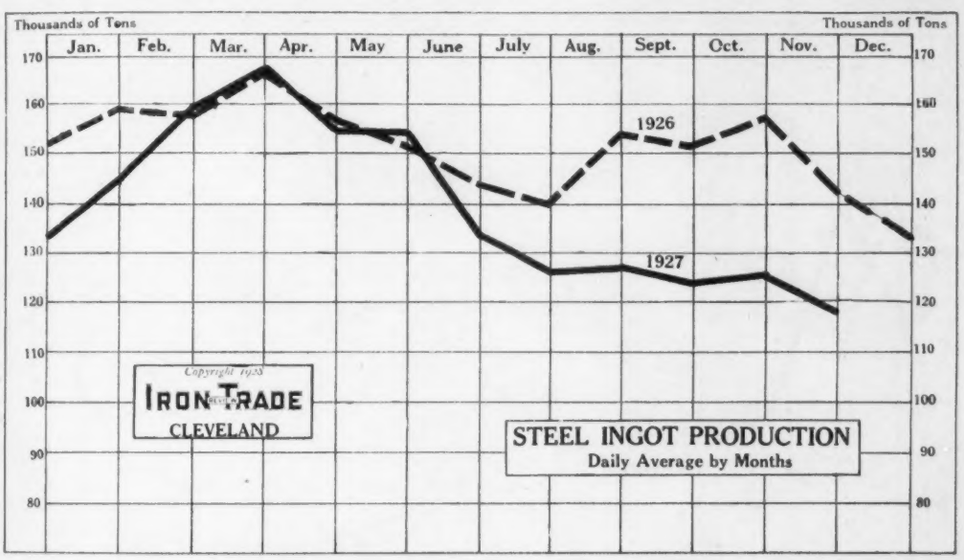


Pig Iron Production Declines 7 Per Cent Below That of 1926

ACCORDING to preliminary estimates the total production of pig iron in 1927 was 36,511,000 tons. This was 7 per cent below the output for the preceding year. The peak month of production came in April with a daily average of 114,146 tons. By the November the daily average had declined to 88,728 tons or a drop of 23 per cent compared with the peak month.



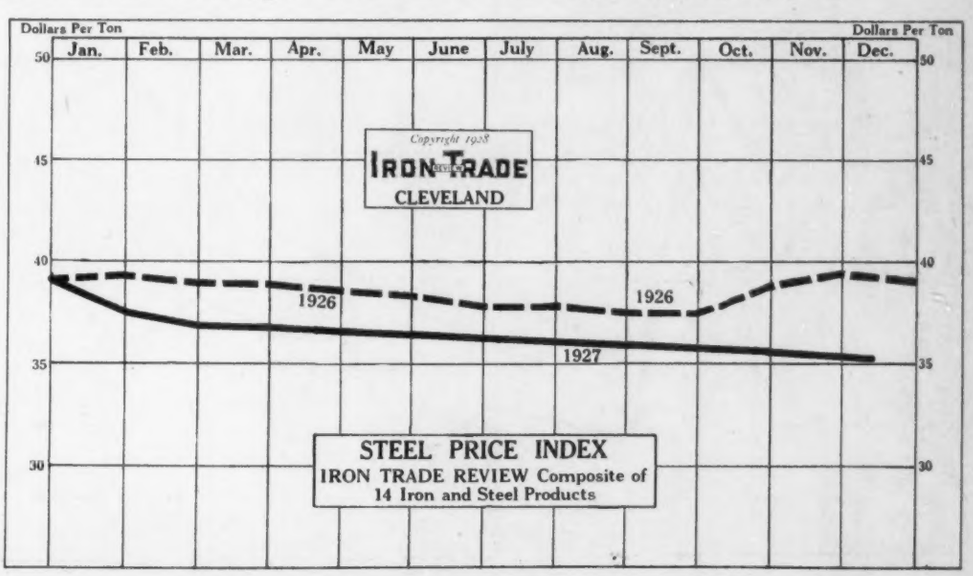
Steel Ingot Output Down 28 Per Cent From Spring Peak to November



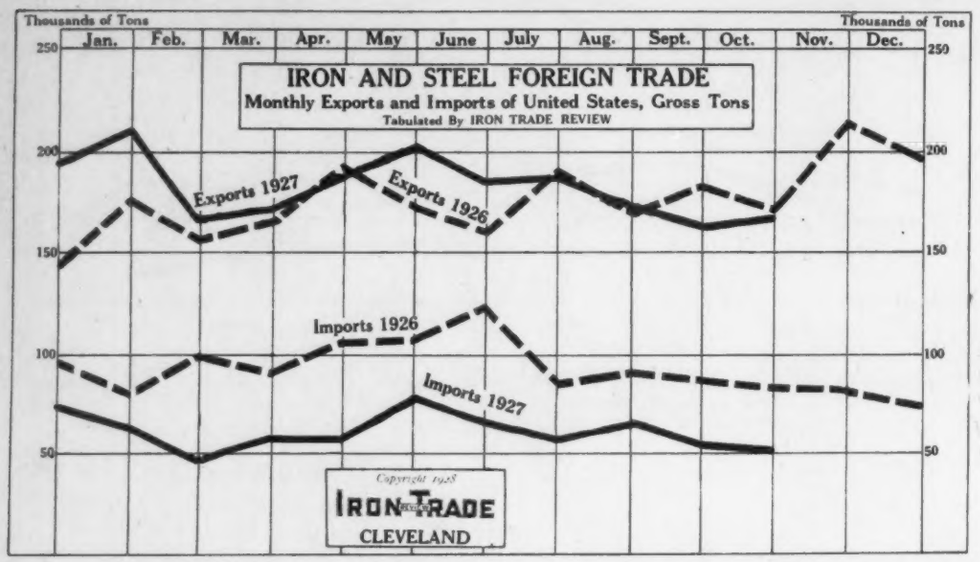
DURING 1927 the output of steel ingots and castings totaled 44,214,000 tons. This compared with a total of 48,294,000 tons in 1926 and 45,394,000 tons in 1925. In the March the daily average output of 166,633 tons reached a new peak for all time. By November the rate of output had dropped to 119,299 tons or a decline of 23 per cent from the peak.

Iron and Steel Price Average Declines to Lowest Ebb in Years

DURING the last year there was a continuation of the decline of iron and steel prices which was manifest in both 1925 and 1926. At its lowest ebb IRON TRADE REVIEW'S *composite market index dropped to the lowest level since 1921. Unlike 1926 there was no recovery in the autumn and by December the index had fallen to 33 per cent over 1913.*



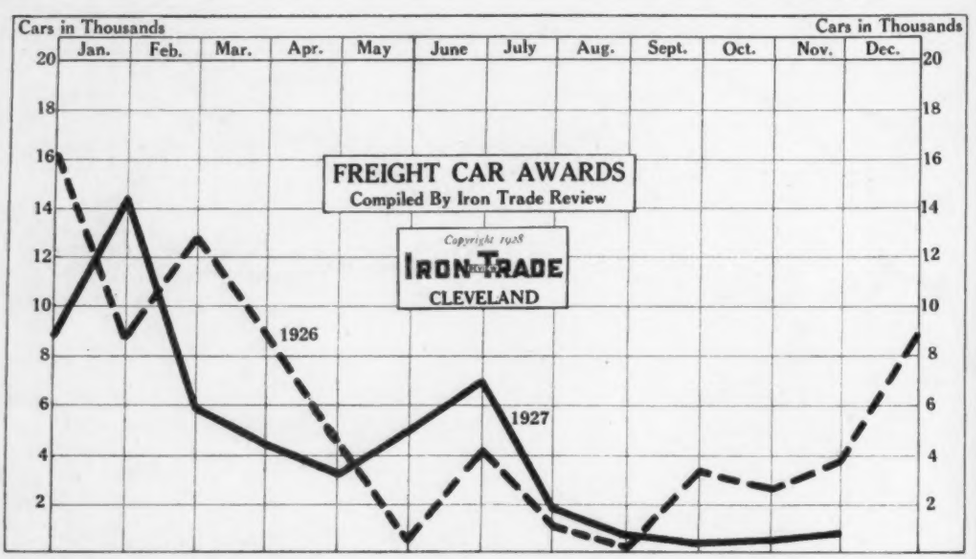
Imports of Iron and Steel Products Decline Sharply in 1927



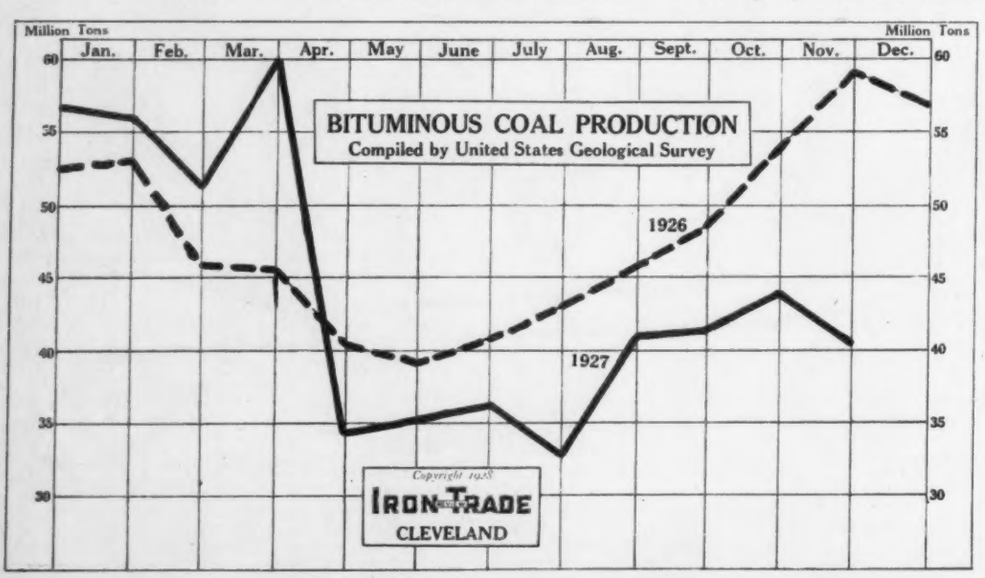
THE outstanding feature of the iron and steel foreign trade in 1927 *was the decline of pig iron imports. For the first ten months of the year pig iron imports were* 102,627 *tons against* 413,430 *tons in the like period of* 1926. *During the year there was an increase in exports of all iron and steel products of* 4 *per cent and a decline of imports of* 34 *per cent.*

Railroad Buying of Cars at Lowest Level Since 1921 Recession

PURCHASES of freight cars during 1927 *were at the lowest ebb since* 1921. *Aggregate awards for new cars for the first* 11 *months of the year amounted to* 45,145 *compared with* 54,425 *in the like period of* 1926. *December brought a large inflow of inquiries and an increase of buying shortly was forecast. This was in accordance with the seasonal tendency.*



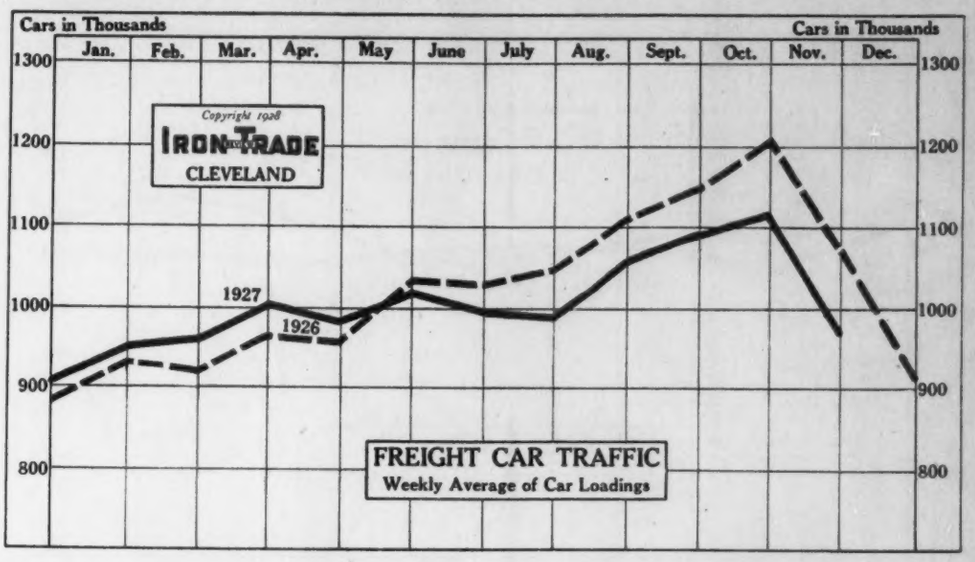
Coal Production Declines Due Partly to Bituminous Strike



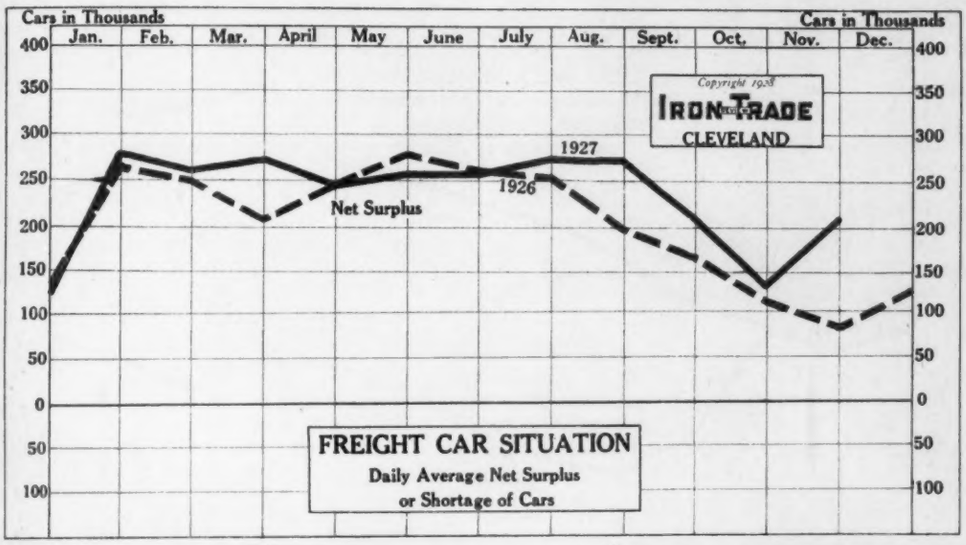
PRODUCTION of bituminous coal in 1927 *was retarded by the strike in the union fields and by slackened demand. Because of the heavy output during the early months the output for the year was less than* 9 *per cent below that of* 1926. *It was* 20 *per cent greater than the total for the strike year of* 1922. *In December, however, production of coal was* 33 *per cent below one year ago.*

Loadings of Revenue Freight During 1927 Drop by 2 Per Cent

SLACKENED movements of coal and restricted industrial activities brought about a decline in railroad traffic in 1927. During the first part of the year the traffic volume exceeded the corresponding period of 1926. In succeeding months however there was a spread in favor of 1926. The total traffic movement for 1927 fell about 2 per cent below that of 1926.



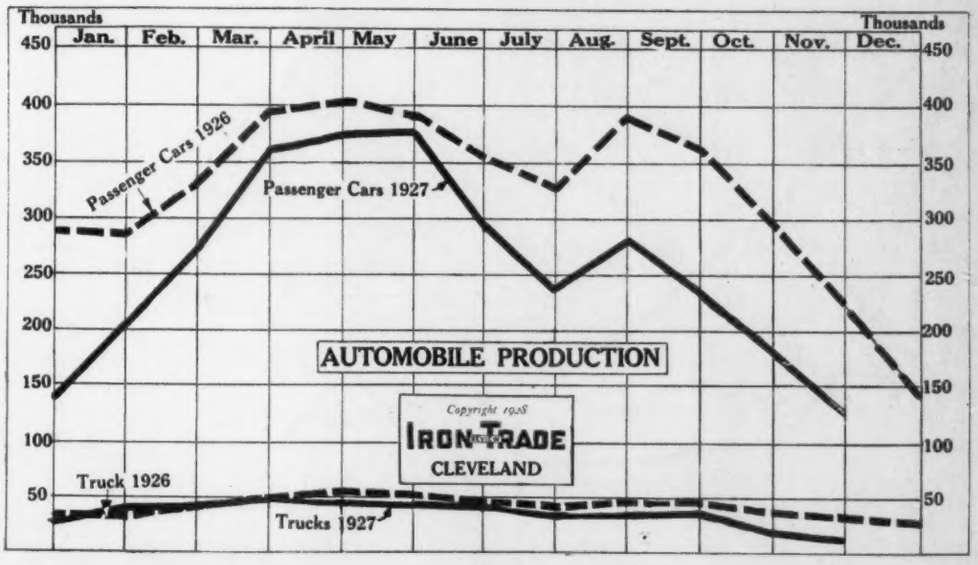
Roads Have Large Surplus of Idle Cars, Due to Less Traffic



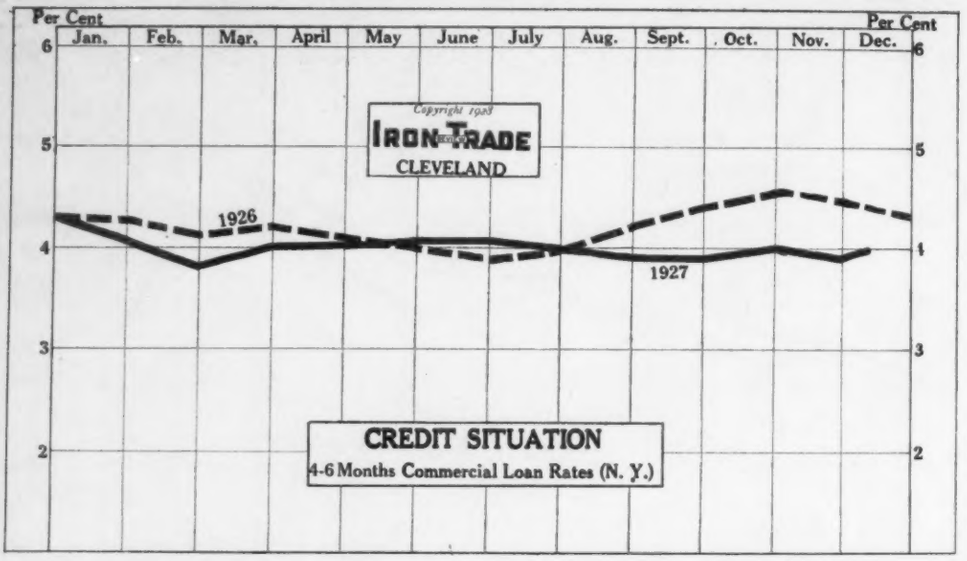
NEEDS of transportation in the country in 1927 put no important strain upon the facilities of the railroads. As shown by the accompanying graph the large volumes of traffic during the early part of the year were easily handled and with a margin of idle cars. The peak traffic of autumn also was passed without a semblance of a shortage of cars.

Automobile Production Drops About 25 Per Cent Below 1926

THE production of automobiles and trucks in the United States and Canada in 1927 approximated 3,500,000. During the first 11 months the output totaled 3,382,000 cars and trucks. The decline of 20 per cent in output from the 4,424,000 cars and trucks produced in 1926 was chiefly due to the suspension of production for many months by the Ford Motor Co.



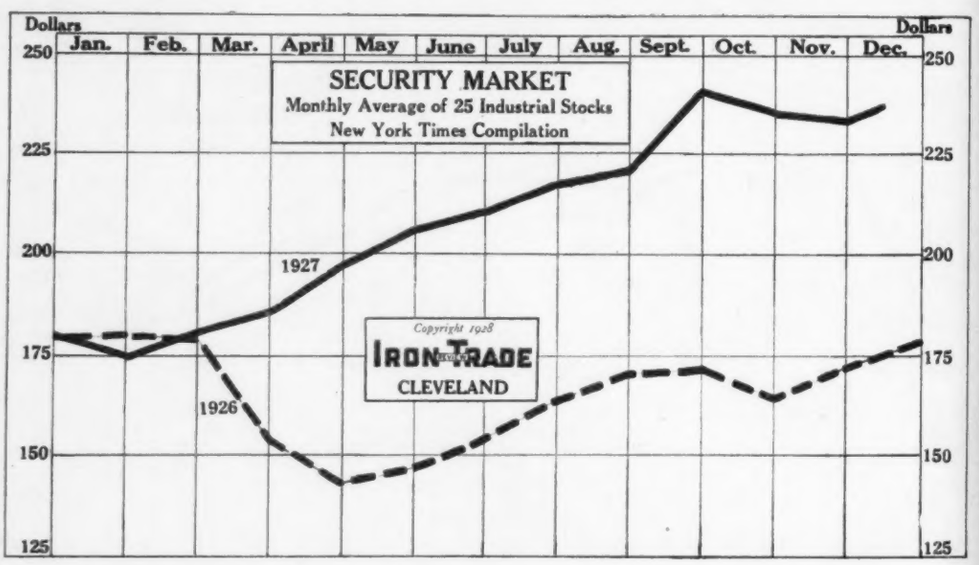
Ample Credit and Easy Money Conditions Still Prevailing



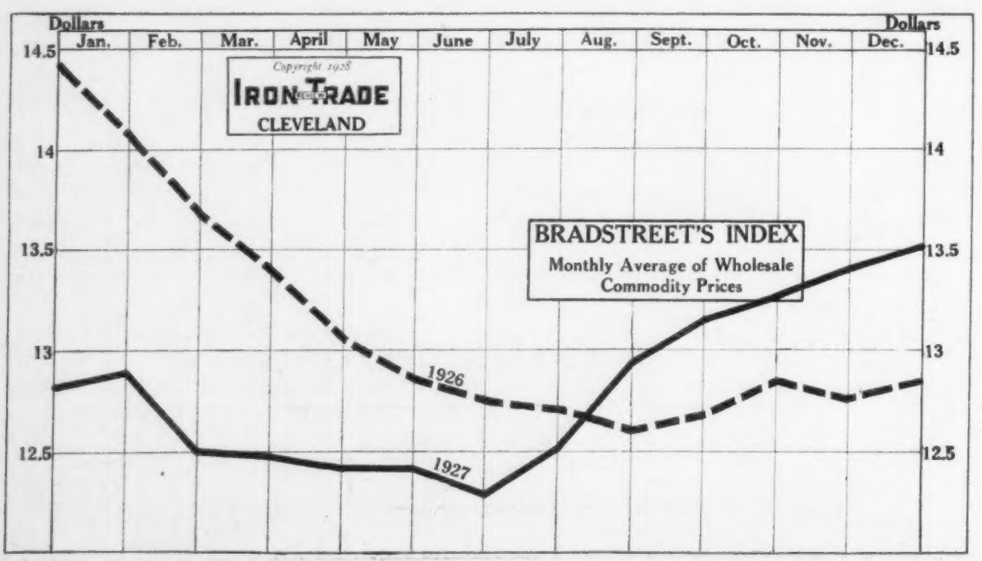
AMPLE credit reserves and easy money were underlying factors of strength in business and the security market during 1927. The abundance of credit is shown by the fact that there was no important lifting of rates despite the rising number of business failures during the year. An important development has been the recent increase of exports in gold.

Security Prices Make New Highs in Great Bull Movement

THE year 1927 may be characterized as a period of rising security prices. While there were occasional irregularities the onward sweep of the bull movement buoyed up by the tremendous reservoir of easy money continued through the year. By the close of the year the average of 25 industrial stocks had touched new high levels for all time. No bear market was in sight.



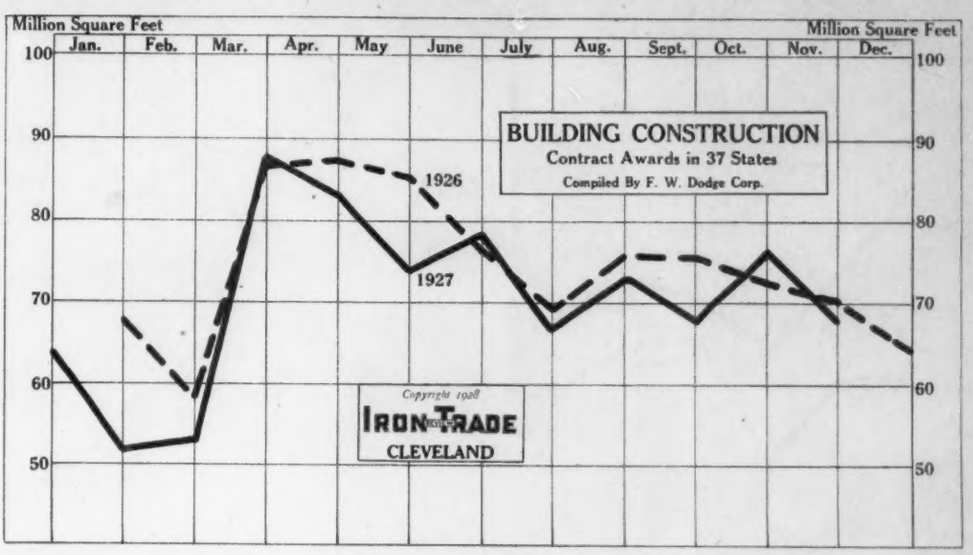
Wholesale Commodity Prices Turn Upward, Bradstreet's Shows



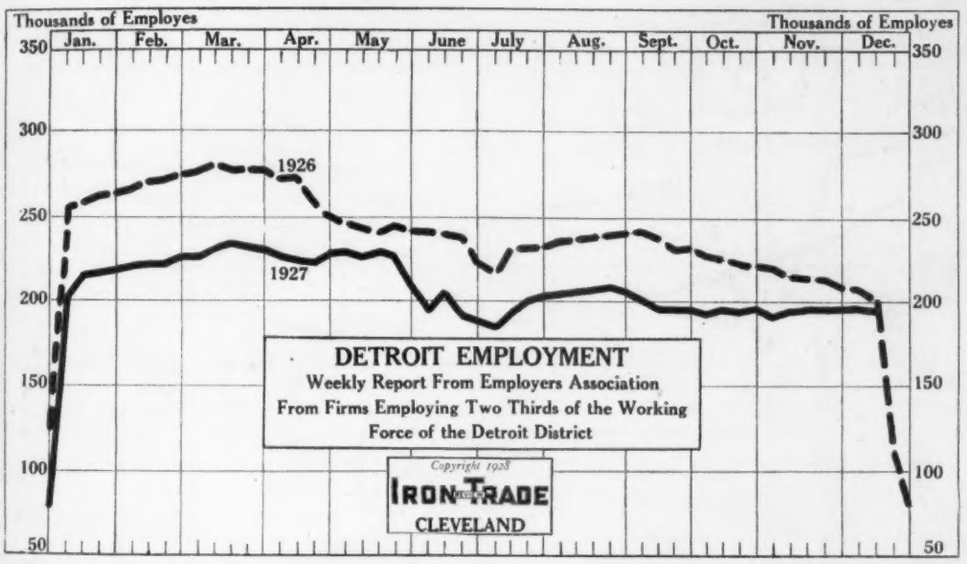
ONE of the most important developments in the economic situation of 1927 was the upward turn of wholesale commodity prices. Bradstreet's index reached its lowest point in July. By December the index had advanced 9 per cent and it was more than 5 per cent over the corresponding period of twelve months before. Higher farm product prices helped the rise.

Building Construction Declines Less Than 4 Per Cent in 1927

BUILDING construction as reported in 37 northeastern states by the F. W. Dodge Corp. fell somewhat below the total for 1926. Contract awards for eleven months amounted to 787,200,000 square feet against 819,-100,000 square feet in the like period of 1926. The decline was less than 4 per cent, and the large scale construction activities has been one of the strong factors.



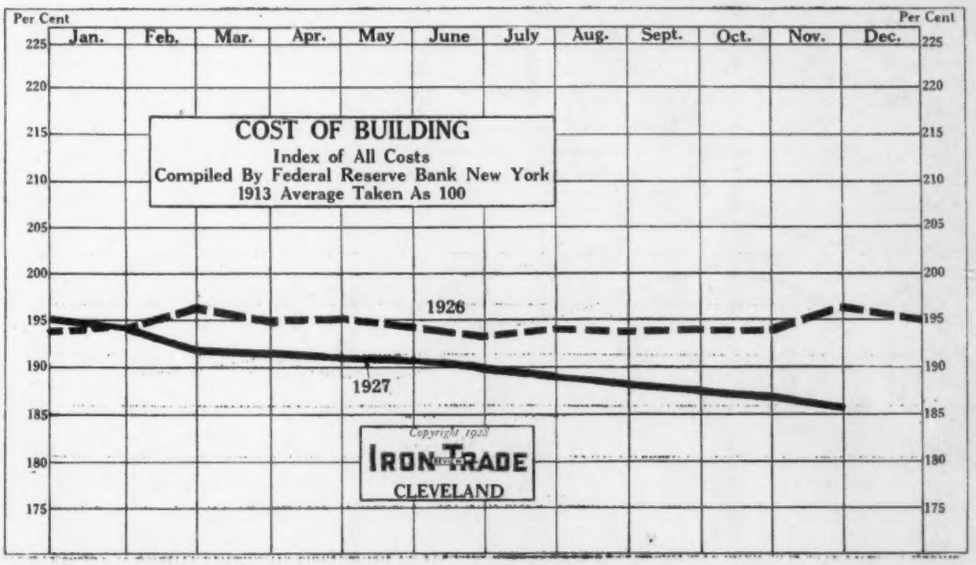
Detroit Employment Curve Begins Gain, as Ford Starts


Thousands of Employes
Thousands of Employes
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
350 300 250 200 150 100 50
1926
1927
DETROIT EMPLOYMENT
Weekly Report From Employers Association
From Firms Employing Two Thirds of the Working
Force of the Detroit District
Copyright 1928
IRON TRADE
CLEVELAND

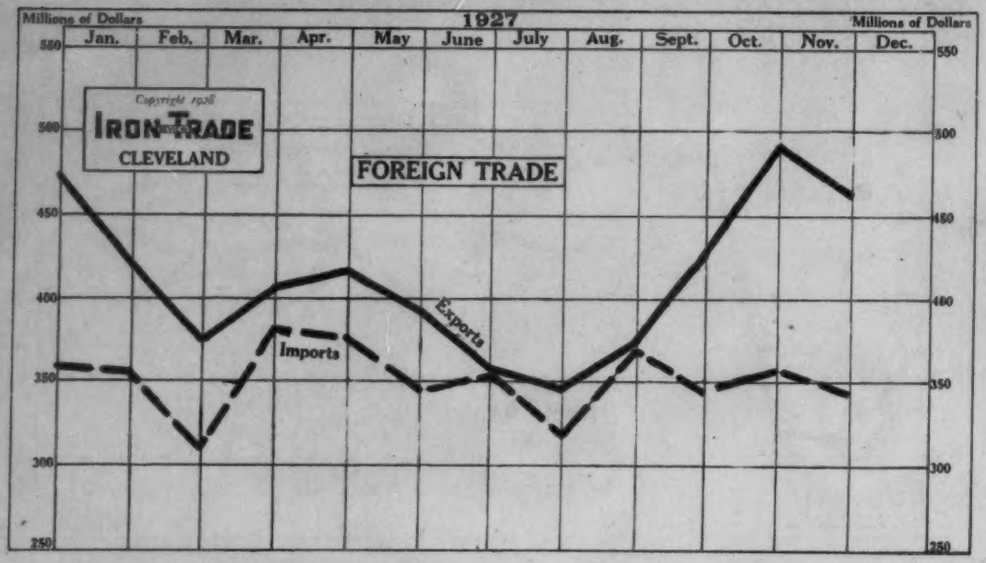
EMPLOYMENT in the Detroit district continued well below the level of the corresponding period of 1926 till the last few weeks of the year. In 1926 overproduction caused sharp curtailment of motor car plants in December. This year there was underproduction of automobiles due to Ford's inactivity. In the third week of December Detroit employment was 86,000 over one year ago.

Cost of Building Down as Materials Decline; Wages High

IN DECEMBER the cost of building was nearly 11 points lower than it had been 12 months before. The reduction in cost was entirely due to lower material prices. These had fallen nearly 20 points in the past year. Meanwhile wages of building labor have steadily advanced to the highest peak for all time. Building now costs 87 per cent over the prewar level.


Per Cent
Per Cent
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
225 220 215 210 205 200 195 190 185 180 175
COST OF BUILDING
Index of All Costs
Compiled By Federal Reserve Bank New York
1913 Average Taken As 100
1926
1927
Copyright 1928
IRON TRADE
CLEVELAND

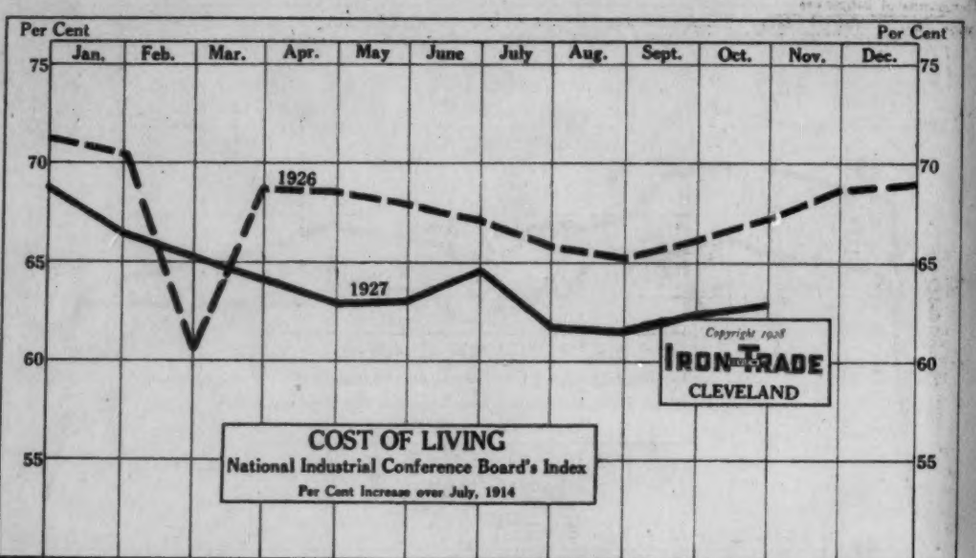
Exports of American Merchandise Greater; Imports Less



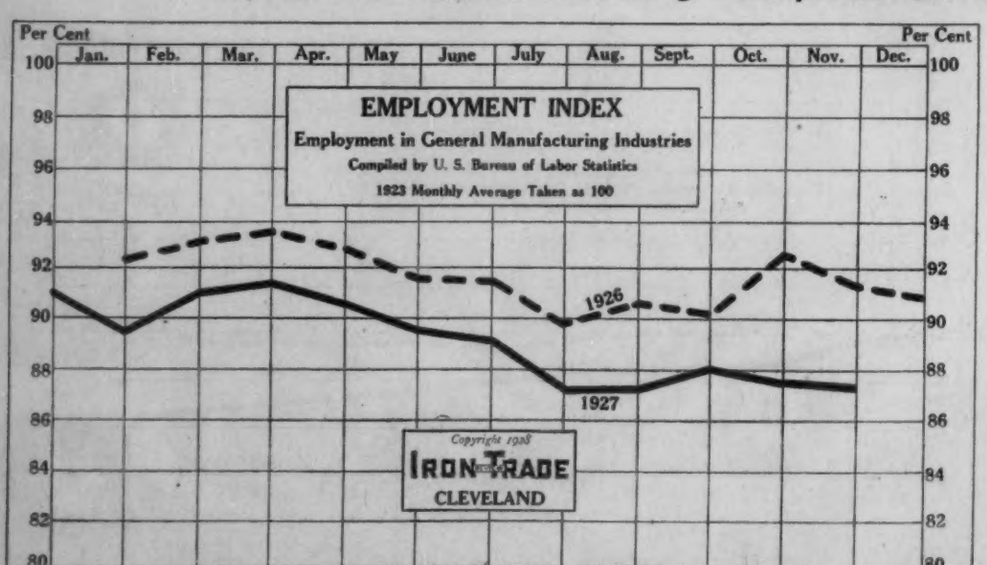
EXPORTS of merchandise from the United States for the first 11 months of 1927 amounted to $4,457,762,000. This compared with $4,343,291,000 in the corresponding period one year ago. Imports totaled $3,854,025,000 against $4,071,426,000 in the corresponding period of 1926. Excess of exports of $603,000,000 compared with $269,217,000 for the same period of 1926.

Living Costs Held Below Levels of Preceding Year in 1927

THE cost of living has been running consistently below the corresponding months of 1926 throughout 1927. During the year there have been declines in rent, in clothing prices and in fuel costs. Retail food prices have been fairly firm. At the end of the year the cost of living stood 65 per cent above the 1914 level compared with 68 per cent above 1914 in November, 1926.



Employment in Manufacturing Enterprises Off in 1927

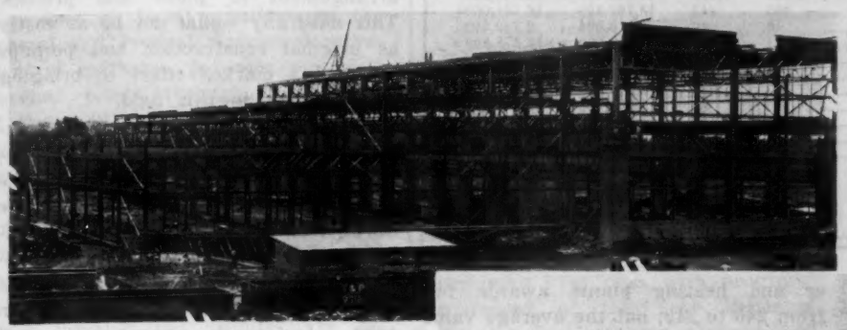


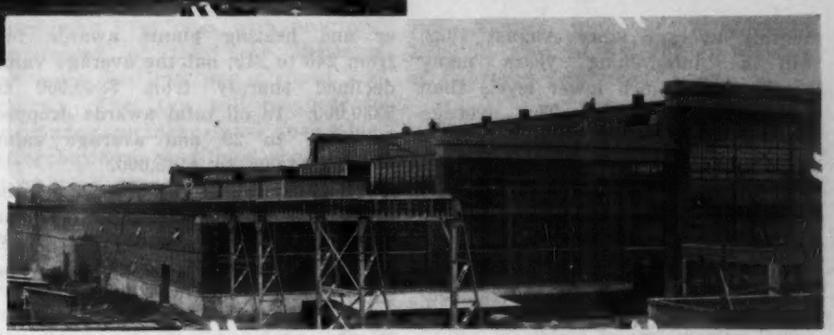
THE recession in general industrial activities was accompanied by an inevitable contraction of employment. During all months of the year the general index of payrolls in manufacturing industries, computed by the Bureau of Labor, shows a small decline below that of 1926. In October, the latest month available, the index stood at 87.5 per cent of the 1923 level.

Industry Continues Steady Building; Keeps Pace Set by Preceding Year

Recession in Power Plants, Oil and Metal Works

By George H. Manlove





NEW TERMINAL OF TEXAS & PACIFIC RAILROAD, FORT WORTH, TEX. DESIGNED, CONSTRUCTED AND EQUIPPED BY THE AUSTIN CO.

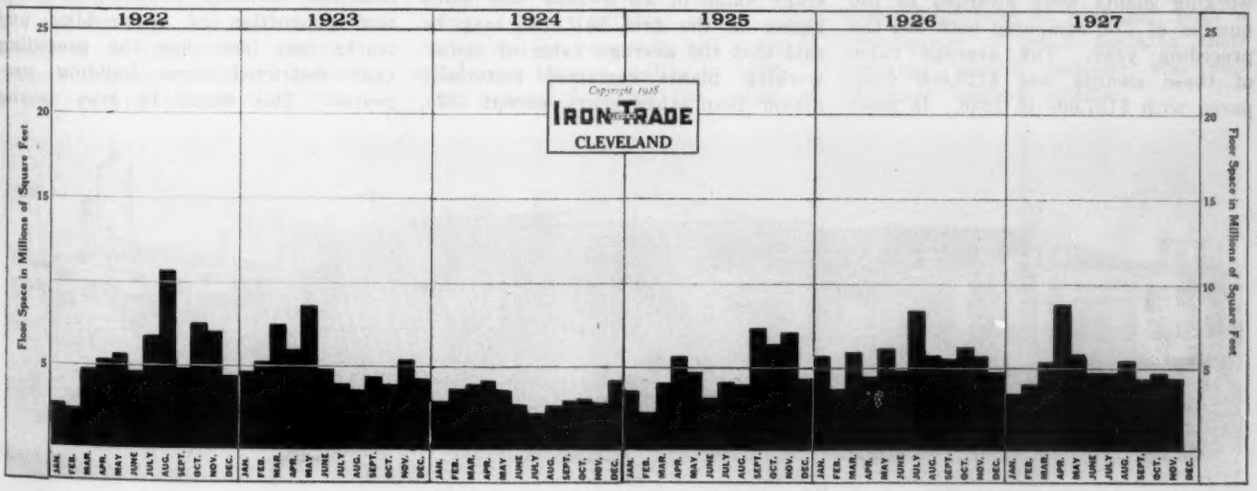
IN A year when business generally was noticeably slowed in the latter half, industrial building held its average in 1927 to an unexpected degree. While there was a decline from 1926 it was slight and the two years ran close in the number of projects awarded, with averages of about 380 each month. Since the two boom years, 1919 and 1920, when unusual industrial building records were made, awards in no other year have exceeded the totals of 1926 or 1927.

An upward trend started in 1924 and continued in a steadily mounting curve through the two succeeding years. In 1927 this rising curve flattened and dipped slightly, although the record for the two years is fairly level. The record of industrial construction in its steady growth speaks well for its stability in the face of the general slackening of business in the latter part of the year just closed.

January and February of 1927 dipped sharply from the average line of the later months of 1926, coming back strongly in March and making the year's high point in March. Indication then was for a record year, as the high point usually comes later. The spurt failed to hold and in April the number of projects dropped back to a level that remained fairly constant until the end of the year.

An interesting feature of the record of 1927 is that while the peak of the year expressed in square feet of building area in awards came in April, the largest number of awards came in October. Awards in April numbered 426, for buildings to contain 8,798,700 square feet of floors. In October the number of projects awarded increased to 447, while the square feet of floor space fell to 4,750,200, slightly more than half the April space. November was only a shade behind the preceding month in number and area.

The total range in 1927 was greater than in 1926, the high mark in April being slightly above the high of July, 1926, while the lowest mark in 1927, in January, was a little below the low February record in 1926. In fact, April, 1927, made the highest



TREND OF INDUSTRIAL CONSTRUCTION. DATA BY F. W. DODGE CORP.

Building Contemplated in 1926 and 1927

Figures for 1927 Include Period Jan. 1 to Dec. 1

	No. of Projects		Cost of Construction	
	1927	1926	1927	1926
Metal working	907	1,143	$79,737,200	$160,896,600
Miscellaneous and unspecified	1,312	1,433	64,150,500	66,688,300
Food products	1,095	1,110	64,252,600	58,070,200
Textile, cordage, etc.	303	443	13,762,500	16,401,000
Rubber working	40	46	1,819,500	2,742,600
Oil, mills, refineries	29	103	7,142,200	12,378,800
Central heating and power plants	247	337	182,002,800	142,837,100
Chemicals, paints, etc.	196	205	17,151,500	21,420,900
Mining, quarrying, etc.	320	339	42,317,200	48,121,800
Leather working	61	62	1,950,100	3,363,000
Paper and pulp mills	87	109	11,465,500	9,462,000
Printing and binding	167	200	10,656,100	24,377,200
Woodworking	265	297	8,911,600	16,346,800
	5,029	5,827	$505,319,300	$583,106,300

Data Supplied by F. W. Dodge Corp.

monthly average since August 1922.

In the intervening years many months made much lower levels than the lowest in 1927. The average monthly figures were unusually steady the past year, showing minimum decline from the average level and only one marked peak.

Decline Was in Spots

Had it not been for severe contraction in building operations by three major divisions of industry the past year would have made a much better showing. Metalworking, central heating and power and oil and refining plants showed a recession of such degree as to affect the record materially.

Of a total loss of $232,130,600 in valuation of awards, $201,104,100 is accounted for by these three divisions. The metalworking industry dropped from $154,532,500 in 1926 to $96,807,500 in 1927. Power and central heating plants dropped from $201,726,300 to $72,523,500 and oil and refinery projects from $18,397,800 to $4,221,500. The decline was in number of projects as well as in average value, but most marked in the latter. Metalworking plants were awarded to the number of 774, compared with 984 the preceding year. The average value of these awards was $125,000 compared with $157,000 in 1926. In power and heating plants awards fell from 240 to 219, but the average value declined sharply from $840,000 to $330,000. In oil total awards dropped from 87 to 29 and average value from $211,000 to $145,000.

A comparison of the first 11 months of 1927 as to number of projects and floor space, with monthly averages from 1919 is given in the following table:

Year and month Monthly average	No. of projects	Square feet
1919	636	12,772,000
1920	511	10,652,000
1921	274	2,981,000
1922	323	5,463,000
1923	338	5,184,000
1924	288	3,396,000
1925	356	4,893,000
1926	385	5,655,300
1927		
January	282	3,191,100
February	330	3,792,600
March	418	5,343,300
April	426	8,798,700
May	387	5,641,700
June	371	4,857,600
July	327	4,836,200
August	395	5,352,300
September	389	4,367,000
October	447	4,750,200
November	443	4,370,200
December	.....	.....
Total	.....	55,300,900

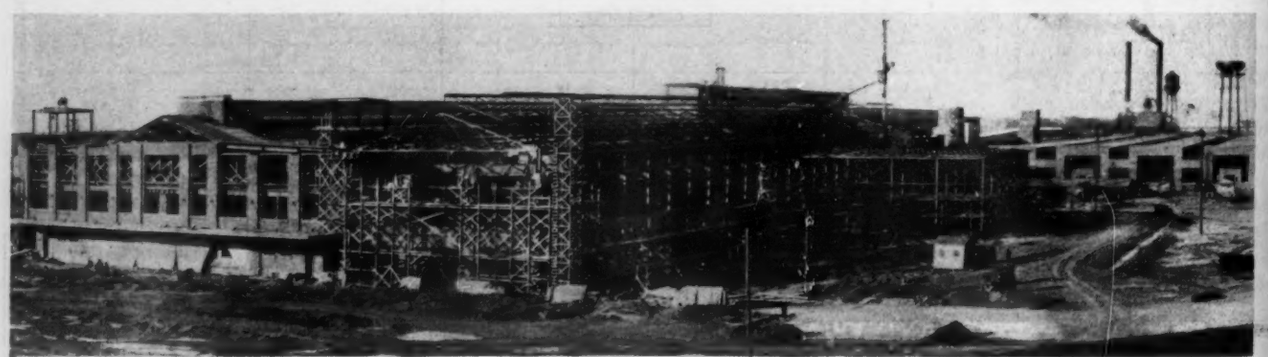
The shrinkage in average value apparently came late in the year, as the record by months shows the average value of all awards was much higher in the first half. It may be said that the average value of metalworking plants remained materially higher than other years, except 1926, in spite of its sharp drop from that year. In 1925 the average value of that class of awards was $86,658, about half that of 1926. The decline of the past year is only part way back to that level.

Much work in recent months has consisted of building to provide better arrangement of plant and process. This naturally would not be as costly as original construction and perhaps has had a marked effect in bringing down figures in this field.

A spread always is met in construction contemplated and that actually awarded and built. In the figures reported by the F. W. Dodge Corp., New York, on which these statistics are based, the divergence between contemplated and awarded projects was 814 in 1927 and 1206 in 1926. Apparently projects were not outlined as freely last year as in the preceding twelve months and more of those actually contemplated were carried through. This is indicated by the fact that the difference between contemplated and awarded jobs was 1206 in 1926 and 814 in 1927. On the other hand the value of awards in 1926 was $9,118,800 greater than that of the contemplated projects, indicating an increase in cost of materials above estimates or that projects were enlarged between their inception and completion. In 1927 the reverse was true. Awards fell short of contemplated value by $145,124,800. The only deduction from this condition is that builders completed their projects on a smaller scale than they had planned, tempering their enlargements to the receding status of general business. The evidence of these figures is that smaller construction went ahead better than the larger.

Automotive Activity Was Less

It is not clear what influence the quieter condition of the automotive field has wielded. Probably the fact that production of automobiles and trucks was less than the preceding year restricted some building programs. This would be true among



PONTIAC PLANT OF OAKLAND MOTOR CAR CO., PONTIAC, MICH., UNDER CONSTRUCTION

manufacturers of cars and also among makers of accessories and parts. Garage and machine shops also probably were built in less volume.

Costs of building material varied little from the preceding year but such variation as did appear was downward. As a whole, costs were altered little, though some advantage accrued to the builder in the general and gradual downward movement of markets. In some materials lessened prices through the middle of the year were somewhat balanced by a partial advance late in the year.

Labor conditions have been excellent and strikes have been few and small, making little interference with construction. Recent developments in arbitration and continuation of work while jurisdictional disputes are being settled has made for more continuous work, to the gain of the builder and the worker. Wages have been good and dissatisfaction has been relatively slight. Efforts to build more steadily through the colder months have resulted in less lost time by workers than formerly and this has contributed to better contentment. The longer building season has had the effect also of extending the active season for material suppliers, lessening peak demands and giving greater activity in the quieter season.

New Sections Come Out

A feature of the construction field in 1927 was announcement by Carnegie Steel Co. and the Bethlehem Steel Co. of several new sections. Dimensions of these exceed former beams and give advantages not previously obtained in rolled steel but inherent in fabricated members.

With construction keeping to a relative level for seven months of the past year, in spite of influences tending to lessen activity, it seems likely that the opening year will see a rebound, in keeping with activity in general business. Every indication is for renewed construction that industry may keep pace with progress. The record of the year indicates that much building was planned and deferred. That this will reappear in the coming months seems inevitable. Better business conditions should call for as much expansion as was planned a year ago, with added capacity needs.

The outlook for recovery of the oil industry to a point requiring large plant facilities in addition to existing capacity is not bright. Production remains in excess of consumption and storage is the problem. This may give additional tank demand.

Metalworking has been expanding tremendously but in the face of declining prices has not seen its way clear to add to its capacity as largely as in former years. An upward tendency in prices and tonnage at the close of the year gives promise for the new year and possibly this may cause resumption of activity to a degree requiring much new construction.

Public utilities built few giant plants in the past year, though the number of projects declined little. If demand has caught up with existing large facilities other great plants will be necessary and some of these may become reality in 1928.

In general industry the pause of 1927 augurs well for activity in 1928, in view of general expectation of improved conditions.

Construction Awarded in 1926 and 1927

Figures for 1927 Include Period from Jan. 1 to Dec. 1

	No. of Projects.		Cost of Construction	
	1927	1926	1927	1926
Metal working	774	984	$96,807,500	$154,532,500
Miscellaneous and unspecified	1,079	1,139	47,660,000	45,046,100
Food products	908	870	46,492,500	58,975,400
Textile, cordage, etc.	219	254	9,721,300	13,374,300
Rubber working	34	43	2,162,500	3,106,600
Oil, mills, refineries	29	87	4,221,500	18,397,800
Central heating and power plants	219	240	72,523,500	201,726,300
Chemicals, paints, etc.	179	170	14,027,000	17,810,000
Mining, quarrying, glass	279	276	35,456,700	31,771,400
Leather working	52	50	1,855,100	6,750,000
Paper and pulp mills	75	93	10,423,500	9,479,300
Printing and binding	158	168	12,754,600	16,313,600
Woodworking	210	247	6,088,800	15,041,800
	4,215	4,621	$360,194,500	$592,325,100

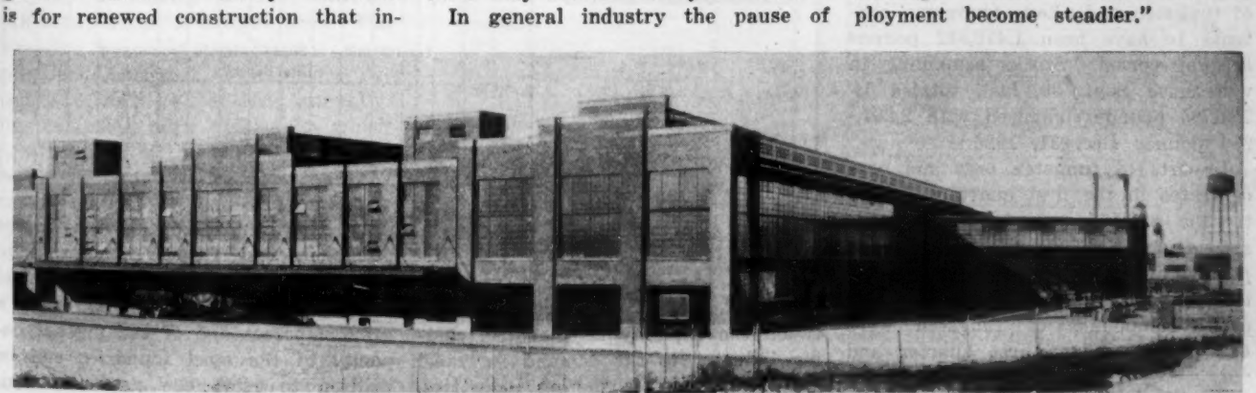
Data supplied by F. W. Dodge Corp.

Sees Prospect Good for Electrical Industry

Gerard Swope, president of the General Electric Co., Schenectady, N. Y., reviewing business conditions for 1927 and commenting on the outlook for 1928, says:

"The electrical manufacturing business for 1927 has, on the whole, been satisfactory, and about the same in volume as 1926. Use of electric current in homes and factories has increased 7 per cent over 1926, and except 1921 has shown an increase each year since 1919, when the index was first prepared. Consumption in 1927 was more than double what it was in 1919. This is becoming one of the best indices of general and industrial conditions in America.

"The outlook for 1928, is on the whole, favorable. Economic conditions are sound and the satisfaction of the demand of 120,000,000 people should provide ample business activities with the usual attendant improvement in the art. Earnings of labor have never been so high and with a continuance of good business their earnings should continue and employment become steadier."



COMPLETED OAKLAND PLANT. DESIGNED, CONSTRUCTED AND EQUIPPED BY THE AUSTIN CO.

Tungsten Is Sensitive to Automobile Slump

By Charles Hardy

CONSUMPTION of tungsten is governed mainly by the good or bad business in the high speed steel and tool steel industry. This industry in turn finds its greatest amount of business in the automotive trade, and this trade was very dull in 1927. Therefore, consumption suffered considerably.

As it happened, the European market for tungsten also found itself overloaded with supplies and not a corresponding amount of business. The consequence was that during the year prices worked downwards and touched at times 12s, corresponding with a duty paid price at New York of $9.85 a short ton unit of tungsten. The automobile industry, which takes about 18 per cent of the total steel produced in the United States in normal years, reduced its quota in 1927 to not more than 10 per cent, due on the one hand to the cessation of operations by the Ford Motor Co., and on the other to the waiting attitude adopted by the other automobile manufacturers; a condition which has been reflected in the low percentage of operations in the steel industry as a whole.

The unsatisfactory conditions in the market have reduced the imports of tungsten below the normal figures, and with the resumption of business by Ford and the general anticipation of improved business abroad, tungsten prices have advanced until at the close of the year the foreign price was 15s 3d, equivalent to the American duty paid price of $10.56, with buyers at these figures.

Nine month statistics from the department of commerce show imports of tungsten and alloys (tungsten content) to have been 1,412,812 pounds in that period. Stocks remaining in warehouse Sept. 30, last, totaled 1,791,225 pounds compared with 2,261,984 pounds Dec. 31, 1926.

Imports of tungsten ores and concentrates in the first quarter of 1927 totaled 852,566 pounds and in the second quarter 525,097 pounds. Imports of tungsten, ferrotungsten, tungsten powder, tungstic acid and other compounds of tungsten were 417 pounds in the first quarter and 13,648 pounds in the second quarter.

The domestic mines, operating in Colorado, California and Nevada, are reported to have produced in 1927 not over 1200 tons. With the prospect of general business improving, the chances are that tungsten prices now being quoted will be maintained at least for the first half of 1928, particularly in view of the fact that the Chinese situation is getting more difficult to gage.

The author is head of Charles Hardy Inc., New York.

Steel Castings Capacity Outdistances Demand

(*Concluded from Page* 48)

justified until there is a decided increase in the consumption of cast steel products. If the total production of steel castings in 1927 was 1,320,000 net tons (estimated), only about 55 per cent of the capacity of the steel foundry industry was utilized.

Fig. 2. shows the relation between the capacity of the steel casting industry to the demand for steel castings by the consuming industries. The statistics used for preparing this diagram were taken from the publications of the department of commerce, and the trend as shown by the straight line was computed in the regular way. During the period of the war a great demand for steel castings led to an increase of facilities for producing them but at no time since the war have these facilities reached more than 74 per cent utilization. Moreover, these production facilities have been increasing since that time, thereby causing the percentage of their utilization to gradually decrease, as shown by the straight line in Fig. 2. This has occurred in spite of the increase in consumption of steel castings shown in Fig. 1. Between 1920 and 1927 steel castings consumption increased 16 per cent, yet the percentage of the capacity used for this increased consumption decreased from 70 to less than 60 per cent. During the latter part of last year considerably less than 50 per cent of the capacity of the steel casting industry was utilized.

It is to be expected that the use of steel castings will continue to increase and perhaps at a greater rate than the rate of increase in population. However, it appears that in the public interest further expansion in the facilities for manufacturing steel castings should be delayed until a greater percentage of the present capacity of the steel foundries can be utilized to meet the needs of consumers.

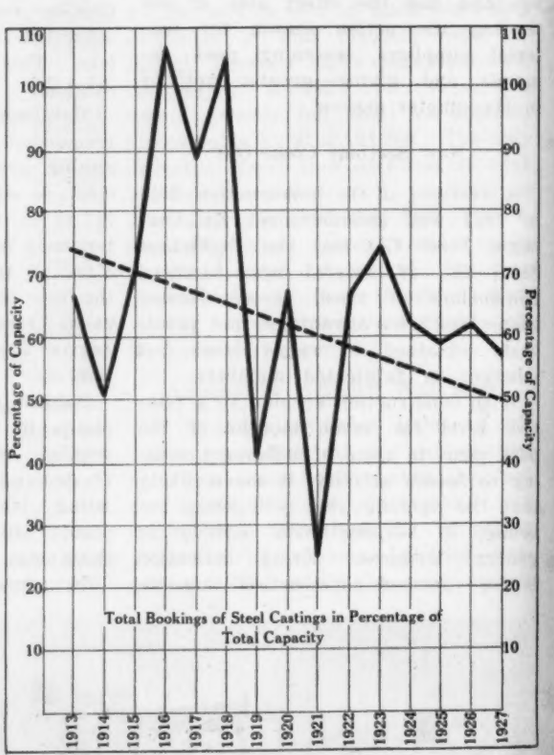


Fig. 2—The curve of relation of total bookings to total plant capacity in the steel foundry industry shows a downward slant, indicating that further expansion of production facilities is not advisable now

By-Product Coke Oven Expansion Is Feature of 1927 Construction

By John D. Knox

REHABILITATION in the iron and steel industry in the United States during 1927 was on a low plane compared with construction programs executed annually for the past few years. Open-hearth furnaces starting their initial campaign during the year just closed, aggregated eight, which is the smallest number of steelmaking units built since 1923. Rolling mill construction for 1927 also failed to command a favorable position compared with annual building programs dating back to 1922. In this connection 57 mills adapted to the rolling of various steel commodities, were scheduled for the first time last year, compared with 113 completed in 1926, 93 in 1925, 67 in 1924, 171 in 1923 and 46 during the previous year. The year just closed was barren of new blast furnace construction.

Extension in the by-product coke industry stamps 1927 as the best year since 1920. By-product coke ovens completed last year totaled 825. Approximately 22 per cent or 202 of the ovens were constructed primarily to secure the gas and are classified as gas oven plants. The remaining by-product units shown in Table VII or 78 per cent of those fired last year for their first campaign were built by iron and steel producers.

Two Units Scheduled

Basic open-hearth furnaces under construction at the beginning of 1928 totaled two and promised 110,000 tons annually to the steelmaking capacity of this country. Steelmaking units scheduled for installation at the beginning of 1927 aggregated four with an estimated output of 275,000 tons. The preceding year 15 open hearths were slated for construction and were designed to yield 947,500 tons annually. This compares with eight units which were included in the building program at the start of 1925 and had an estimated yield of 560,000 tons annually. Open-hearth furnaces in the course of construction Jan. 1, 1924, totaled 16 and were rated to deliver 1,110,000 tons of steel annually while the 14 regenerative furnaces, included in the 1923 building program, promised an output of 1,030,000 tons. At the beginning of 1922 the number of open hearths upon which construction work had been started was four, their rated capacities totaling 280,000 annually. The record established in 1917 when 102 units were built with a combined steelmaking capacity of 5,413,000 tons, never has been surpassed.

The total number of open-hearth furnaces built each year from 1913 to the beginning of 1928 and the gross annual tonnages which have augmented the ingot making capacity of this country, is recorded as follows:

Year	Open hearths completed	Gross tons
1927	8	515,000
1926	18	1,327,500
1925	9	630,000
1924	16	1,110,000
1923	8	535,000
1922	7	364,000
1921	13	620,000
1920	26	1,268,000
1919	23	1,871,000
1918	39	2,192,500
1917	102	5,413,000
1916	105	4,300,000
1915	43	1,759,000
1914	9	507,000
1913	62	3,120,000

The number of open-hearth furnaces built in this country during 1927 with the resultant steel ingot capacity, is listed in Table II by respective companies. The compilation, as shown, includes eight units, 75 per cent of which are rated 100 tons or more capacity. Attention is directed to one company, namely, the Timken Roller Bearing Co., Canton, O., which is a newcomer into the basic open-hearth steelmaking industry. Only upon six occasions in the past 15 years has the annual tonnage furnished by new steelworks construction failed to exceed 1,000,000 tons. The units built in 1927 added 515,000 tons.

Over 5,000,000 tons of basic open-hearth capacity was added to the national output in 1917 when 102 furnaces were completed. The following year the tonnage afforded by open-hearth construction began to decline and this condition prevailed until 1922 when the output of the new units built totaled 364,000 tons. Since 1922, however, steelmaking capacity has been on the increase. In 1923 the completion of eight open hearths with their total production of 535,000 tons registered a gain of 31 per cent compared with the previous year.

Stack Construction Lacking

Blast furnace construction during the year just closed was neglected. Only on two other occasions in the past 22 years, and, those in 1914 and 1922, has a year closed without pig iron producing capacity having been increased. Pig iron capacities in gross tons for all stacks placed in blast each year from 1905 to 1927 inclusive, may be compared in the following table:

Year	Gross tons
1927	None
1926	1,173,000
1925	241,500
1924	120,750
1923	155,250
1922	None
1921	207,000
1920	1,138,500
1919	596,750
1918	1,425,000
1917	2,182,500
1916	530,000
1915	530,000
1914	None
1913	550,000
1912	1,000,000
1911	565,000
1910	1,794,000
1909	1,930,000
1908	1,188,000
1907	2,065,000
1906	1,135,000
1905	1,292,000

At the close of 1927 the Tennessee Coal, Iron & Railroad Co. had two blast furnaces under construction at Fairfield, Ala., one to be ready in February and the other in April.

Records of the past year show that

Table I

Recapitulation

	Completed 1927	Building 1928
By-product coke ovens	925	271
Blast furnaces	0	*2
Open-hearth furnaces	8	2
Rolling mills:		
Bar	1	0
Billet	0	1
Billet-sheet bars	2	1
Black plate	12	0
Blooming	2	2
Merchant	4	1
Pipe, buttweld	2	0
Pipe, lapweld	1	0
Plate, 4-high	1	0
Roughing	1	1
Seamless tube	1	0
Sheet bar-skelp	1	0
Sheet, cluster cold	0	1
Sheet, 4-high cold	3	0
Sheet, 2-high hot	5	0
Sheet, 4-high hot	1	1
Skelp	3	0
Special	2	0
Spring	1	0
Strip, cluster cold	5	0
Strip, cold	3	0
Strip, 4-high cold	2	0
Strip, hot	1	1
Strip, 4-high hot	1	1
Structural	2	0
Total rolling mills	57	10

*Reported in 1927.

15 obsolete stacks in this country were dismantled or were being dismantled as the year closed. This compared with 16 stacks abandoned in 1926, 27 in 1925, 7 in 1924, an 4 in 1923. Blast furnaces, which were dismantled or abandoned in 1927, include the No. 1 stack of the Thomas Iron Co., Hokendauqua, Pa.; the Genesee stack of the Corrigan, McKinney Steel Co. at Charlotte, N. Y.; the "C" stack of the Bethlehem Steel Co., Bethlehem, Pa.; two Mannie stack of the Tennessee Products Corp. at Ruppertown, Tenn., and the "Standard" stack of the same company at Nashville, Tenn.; one stack of the Alleghany Ore and Iron Ore Co., Iron Gate, Va., and one at Buena Vista, Va.; the "C" stack of the Low Moor Iron Co. of Virginia, Covington, Va.; the "Robesonia" stack of the Bethlehem Steel Co., Robesonia, Pa.; the "Clinton" stack of the Clinton Iron Co., Pittsburgh; Nos. 1 and 2 stacks of the Dunbar Corp., Dunbar, Pa.; the No. 1 Swede stack of the Allan Wood Iron & Steel Co., Swedeland, Pa.; and Haselton No. 1 of the Republic Iron & Steel Co., Youngstown, O. In addition to the blast furnaces scrapped, the 20-inch skelp mill of the Rupublic Iron & Steel Co., Youngstown, O., was dismantled. A skelp mill at the Columbia, Pa., division of the Reading Iron Co. also was abandoned. A charcoal forge including 26 knobbling fires was abandoned by the Parkesburg Iron Co., West Chester, Pa. The Alan Wood Iron & Steel Co. dismantled its Schuylkill Iron Works at Conshohocken, Pa., which produced blue annealed sheets since 1857. Four sheet mills were dismantled at the St. Louis plant of the National Enameling & Stamping Co. At the close of the year provision was being made by the National Tube Co. to abandon its Continental works at Pittsburgh.

As shown in Table V, stacks remodeled in 1927 totaled 11. In 1926, 18 stacks were rebuilt which compared with 10 in 1925, 22 in 1924, 5 in 1923, 13 in 1922, 3 in 1921 and 18 in 1920. At the beginning of 1928, remodeling work was started on three stacks, as shown in Table VI.

As shown in Table VII, new by-product coke ovens built during 1927 totaled 925, which is the largest num-

Equipment Completed or Building During 1927

Table II

Open Hearths Completed in 1927

Company	Number of furnaces	Rated capacity, tons	Annual capacity, tons
American Rolling Mill Co., Ashland, Ky.	2	100	140,000
American Steel Co. of Indiana, Inc., Terre Haute, Ind.	1	50	35,000
Carnegie Steel Co., Braddock, Pa.	**4	.....	.....
Colorado Fuel & Iron Co., Pueblo, Colo.	1	100	70,000
Columbia Steel Corp., Torrance, Calif.	1	40	30,000
Otis Steel Co., Cleveland	1	100	70,000
Timken Roller Bearing Co., Canton, O.	1	100	70,000
Weirton Steel Co., Weirton, W. Va.	1	150	100,000
Total	8	.....	515,000

**Replaced and capacity increased.

Table III

Open Hearths Building Dec. 31

Company	Number of furnaces	Rated capacity, tons	Annual capacity, tons
Continental Steel Corp., Kokomo, Ind.	2	80	110,000

Table IV

Blast Furnaces Building Dec. 31

Company	Number of furnaces	Rated capacity, tons	Annual capacity, tons
Tennessee Coal, Iron & Railroad Co., Fairfield, Ala.	*2	600	414,000

*Reported in 1926.

Table V

Stacks Remodeled During 1927

Company	Number or name
American Rolling Mill Co., Ashland, Ky.	No. 2
American Rolling Mill Co., Ashland, Ky.	Norton
Carnegie Steel Co., Rankin, Pa.	Nos. 3 and 4
Hamilton Furnace Co., Hamilton, O.	Hamilton
Illinois Steel Co., Gary, Ind.	No. 9
Illinois Steel Co., S. Chicago, Ill.	No. 2
Inland Steel Co., Indiana Harbor, Ind.	No. 1
National Tube Co., McKeesport, Pa.	No. 2
Youngstown Sheet & Tube Co., Campbell, O.	"A"
Youngstown Sheet & Tube Co., Hubbard, O.	No. 1
Total	11

Table VI

Stacks Being Remodeled Dec. 31

Company	Number or name
Illinois Steel Co., S. Chicago, Ill.	No. 10
Bethlehem Steel Co., Steelton, Pa.	"B"
Bethlehem Steel Co., Sparrows Point, Md.	"A"
Total	3

Table VII

By-Product Ovens Completed, 1927

Company	Number of ovens	Type of ovens	Est. annual coking cap. tons
Alabama By-Products Corp., Birmingham A.	49	K-B	350 000
Battle Creek Gas Co., Battle Creek, Mich.	7	K-B	24.500
Bethlehem Steel Co., Johnstown, Pa.	77	K-B	399 000
Bethlehem Steel Co., Lackawanna, N. Y.	57	K-B	364 000
Carnegie Steel Co., Clairton, Pa.	348	K-B	2,721 000
Central Furnace Co., Massillon, O.	49	K-B	306 600
Citizens Gas Co., Indianapolis, Ind.	40	W	147.000
Consumers Power Co., Flint, Mich.	29	K-B	94.800
Diamond Alkali Co., Painesville, O.	23	K-B	158.900
Ford Motor Co., Fordson, Mich.	120	W	440 000
Michigan Alkali Co., Wyandotte, Mich.	39	K-B	245.000
New England Fuel & Trans. Co., Everett, Mass.	55	W	201.500
Republic Iron & Steel Co., Youngstown, O.	**43	K-B	280.300
Trumbull-Cliffs Furnace Co., Warren, O.	17	K-B	113 400
West Boston Gas Co., Framingham, Mass.	15	K-B	33,200
Total	925		5,879,200

**Replacement; not included in total.
Type of Ovens: K-B, Koppers-Becker; W, Wilputte.

Table VIII

Ovens Building Dec. 31, 1927

Company	Number of ovens	Type of ovens	Est. annual coking cap., tons
Columbia Steel Corp., Provo, Utah	23	K-B	156,100
Connecticut Coke Co., New Haven, Conn.	61	K-B	385,000
Hamilton Coke & Iron Co., Hamilton, O.	45	K-B	291,200
North Shore Coke & Chemical Co., Waukegan, Ill.	31	K-B	115,500
Tennessee Coal, Iron & Railroad Co., Fairfield, Ala.	*63	K-B	459,900
Youngstown Sheet & Tube Co., S. Chicago, Illinois	70	K-B	518,000
Zenith Furnace Co., Duluth, Minn.	41	K-B	245,000
Total	271		2,170,700

*Reported in 1926; not included in total.
Type of Ovens; K-B, Koppers-Becker.

Rolling Mills Completed or Building During 1927

Table IX

Rolling Mills Completed During 1927

Company	No. mills	Type mills
Alan Wood I. & S. Co., Conshohocken, Pa..	1	32″ hot sheet
Allegheny Steel Co., Brackenridge, Pa.....	1	12″ 4-high cold sheet
American Rolling Mill Co., Ashland, Ky....	1	14″ 4-high cold sheet
American Sheet & Tin Plate Co., Gary, Ind.	1	16″ 4-high hot sheet
American Steel & Wire Co., Cleveland.....	5	cluster cold strip
American Steel & Wire Co., Worcester, Mass.	**1	18″ billet
American Steel & Wire Co., Worcester, Mass.	**1	10″ rod
Bethlehem Steel Co., Lackawanna, N. Y....	1	54″ blooming
Bethlehem Steel Co., Lackawanna, N. Y....	2	48″ structural
Bethlehem Steel Co., Sparrows Point, Md...	1	21″ sheet bar-skelp
Bethlehem Steel Co., Sparrows Point, Md...	1	12″ skelp
Bethlehem Steel Co., Sparrows Point, Md...	12	28″ black plate
Bethlehem Steel Co., Sparrows Point, Md...	2	buttweld pipe
Bethlehem Steel Co., Sparrows Point, Md...	1	24″ roughing
Bethlehem Steel Co., Sparrows Point, Md...	4	30″ sheet
Blair Strip Steel Co., New Castle, Pa.....	1	10″ cont. cold strip
Bourne-Fuller Co., Cleveland.....	**1	10″ merchant
Carnegie Steel Co., McDonald, O.....	1	12″ hot strip
Carnegie Steel Co., Munhall, Pa.....	**1	54″ blooming
Carnegie Steel Co., Munhall, Pa.....	**1	44″ blooming
Carnegie Steel Co., Munhall, Pa.....	**1	36″ roughing
Carnegie Steel Co., Munhall, Pa.....	**1	52″ univ.-structural
Carnegie Steel Co., Munhall, Pa.....	**1	28″ structural
Central Alloy Steel Corp., Canton, O.....	1	35″ blooming
Cleveland Cold Rolling Mills Co., Cleveland	1	8″ cold strip
Corrigan, McKinney Steel Co., Cleveland...	1	12″ merchant
Dilworth, Porter & Co., Inc., Pittsburgh...	1	12″ special
Dilworth, Porter & Co., Inc., Pittsburgh...	1	22″ special
Eastern Rolling Mill Co., Baltimore, Md....	**1	34″ hot sheet
Ford Motor Co., Fordson, Mich.....	1	18″ billet-sheet bar
Ford Motor Co., Fordson, Mich.....	1	12″ spring
Forged Steel Wheel Co., Butler, Pa.....	1	24″ cold strip
Illinois Steel Co., Gary, Ind.....	1	9″ merchant
Illinois Steel Co., Gary, Ind.....	1	10″ merchant
Illinois Steel Co., S. Chicago, Ill.....	**1	40″ blooming
Illinois Steel Co., S. Chicago, Ill.....	1	12″ merchant
Inland Steel Co., Indiana Harbor, Ind.....	1	19″ billet-sheet bar
Jones & Laughlin Steel Corp., Woodlawn, Pa.	1	seamless tube
Jones & Laughlin Steel Corp., Pittsburgh...	**1	44″ blooming
Laclede Steel Co., Alton, Ill.....	**1	10″ 4-high hot strip
Newton Steel Co., Newton Falls, O.....	1	14″ 4-high cold sheet
Reading Iron Co., Reading, Pa.....	1	12″ skelp
Rockaway Rolling Mills, Rockaway, N. J...	1	16″ belgian
Spang, Chalfant, Inc., Pittsburgh.....	**1	buttweld pipe
Trumbull Steel Co., Warren, O.....	**1	14″ 4-high hot strip
Trumbull Steel Co., Warren, O.....	1	14″ 4-high cold strip
Tyler Tube & Pipe Co., Washington, Pa....	1	8″ lapweld pipe
Weirton Steel Co., Weirton, W. Va.....	1	14″ 4-high hot strip
Weirton Steel Co., Weirton, W. Va.....	1	16″ 4-high cold strip
West Leechburg Steel Co., Leechburg, Pa...	**1	9″ hot strip
Wheeling Steel Corp., Benwood, W. Va.....	**1	36″ blooming
Wheeling Steel Corp., Benwood, W. Va.....	1	12″ skelp
Youngstown Sheet & Tube Co. Youngstown, Ohio.....	1	72″ 4-high plate
Total.....	57	

**Replacement; not included in total.

Table X

Rolling Mills Building Dec. 31, 1927

Company	No. mills	Type mills
American Rolling Mill Co., Middletown, O..	1	16″ 4-high hot sheet
American Sheet & Tin Plate Co., McKeesport, Pa.....	1	cluster cold sheet
American Steel & Wire Co., Cleveland.....	1	hot strip
American Steel & Wire Co., Worcester, Mass.	**1	10″ rod
Bethlehem Steel Co., Sparrows Point, Md...	*2	lapweld pipe
Bethlehem Steel Co., Lackawanna, N. Y....	1	36″ blooming
Bethlehem Steel Co., Lackawanna, N. Y....	1	32″ roughing
Columbia Steel Corp., Torrance, Calif.....	1	36″ blooming
Continental Steel Corp., Kokomo, Ind.....	1	billet-sheet bar
Interstate Iron & Steel Co., S. Chicago, Ill..	1	billet
National Tube Co., Lorain, O.....	**1	seamless tube
Texas Steel Co., Fort Worth, Tex.....	1	10″ merchant
Wheeling Steel Corp., Steubenville, O.....	1	16″ 4-high hot strip
Total.....	10	

*Reported in 1927; not included in total.
**Replacement

ber of units built in this country for a single year since 1920. Two types of ovens are represented and their combined output added 5,879,200 tons of coke to the national capacity. One year ago 733 ovens were completed, affording 3,941,770 tons. This compares with 299 units in 1925, 684 units in 1924, 28 ovens in 1923, 133 in 1922, 283 in 1921, 1213 in 1920, and 783 in 1919.

By-product coke ovens built by public utility company totaled 202 or 22 per cent of the 1927 complement; ovens completed by steel companies totaled 723, which is equivalent to 78 per cent of the total number completed in 1927. Approximately 82 per cent, or 4,825,800 tons of added by-product coke capacity will be devoted for blast furnace consumption, while approximately 18 per cent, or 1,053,400 tons annually, will be made by the new by-product gas oven plants.

At the beginning of 1928, as shown in Table VIII, regenerative ovens under construction totaled 271. These will give an addition to the national output of by-product coke by 2,170,700. Approximately 66 per cent of the new installations are being constructed by iron and steel companies and approximately 34 per cent by companies desiring the output of gas.

Rolling mills of various types completed during 1927, totaled 57. This compares with 115 in 1926; 93 in 1925; 67 in 1924; 171 in 1923; 46 in 1922; 185 in 1921; 241 in 1920; and 50 in 1919. In addition to the 57 mills which make up the total in Table IX, 16 mills representing replacement also were completed. One of the outstanding features associated with the rolling mill industry during 1927 was the number of 4-high mills installed in various districts in this country.

New Units Installed

The Laclede Steel Co., Alton, Ill., replace a 10-inch, 2-high looping mill with a 5-stand, 10-inch continuous 4-high hot strip mill. The Trumbull Steel Co., Warren, O., replaced a 16-inch continuous and Belgian strip with a 14-inch, 4-high continuous hot and cold wide strip mill. The Weirton Steel Co., Weirton, W. Va., installed a 14 and 16-inch, 4-high roller bearing continuous hot and cold wide strip mill. A 16-inch, 4-high continuous hot tin mill was completed by the American Sheet & Tin Plate Co. at Gary, Ind. The new mill is the only continuous unit in the world rolling black plates continuously and marks a new era in the manufacture of tin plate. The Allegheny Steel Co., Brackenridge, Pa., installed a 12 and 30-inch x 50-inch 4-high mill for cold rolling sheets. The Newton Steel Co., Newton Falls, O., and the American Rolling Mill Co., Ashland, Ky., each installed a train of 4-high, 14-inch cold mills for cold finishing sheets. As the year closed, the American Rolling Mill Co. was installing a 16 and 16-inch, 4-high roller bearing continuous hot wide sheet mill at its Middletown, O., works for the continuous rolling of sheet steel. Directors of the Wheeling Steel Corp. at the end of 1927 authorized the construction of a continuous wide strip mill for the Steubenville, O., division. The total number of rolling mills scheduled during 1927 for the first time are composed largely of black plate, merchant, lapweld pipe, 4-high cold sheet, cluster-type cold strip, and 2-high and 4-high cold strip mills. Eight mills of various types were included in the building program as the year opened. Two of the world's largest steelworks mixers were built at the Ohio works of the Carnegie Steel Co., Youngstown, O., during the year just closed. Each of the mixers are of 1500 tons capacity.

A 24-inch four-stand continuous roughing mill with bevel gear drive was installed at the Farrell works, Carnegie Steel Co. Ten pipe threading and eight pipe cutting-off machines were installed at the Sparrows Point division, Bethlehem Steel Co.

Iron, Steel Outlook Auspicious

HIGH expectations for the first quarter, which inspired the heavy forward coverage of iron and steel requirements in December, now enter the period of fulfillment. The good feeling which quickened practically all markets in the closing weeks of the year has emerged unscathed from the holiday apathy and, with unquestioned evidence of renewed activity in such major outlets for iron and steel as the railroad, automotive and oil industries, the promise for 1928 is bright.

Consumption to Spur Specifying

As December was characterized by contracting, so January should stress specifying. Buyers' commitments have anticipated rising consumption in good measure, but if the prospect is realized further contracting will develop in midquarter. Production, like demand, did not relax in the usual degree over the year-end and is pitched high. Some price advances of the past sixty days are now taking effect.

Heavy pig iron shipments in January will be the sequel to good December bookings. The position of the Chicago and lake furnaces is especially satisfactory. Beehive furnace coke buying is largely over until more furnaces are lighted. Day wages at some Pittsburgh district coal mines have been cut to $4.50 and $4. Scrap tends up.

Year-end specifications for steel bars were heavy, at Chicago being double last December. Plate demand has been only fair, but carbuilders will soon be specifying. As for several weeks, structural steel business is larger in inquiry than awards; Chicago caps a good year with 14,000 tons for the Daily News building placed. Heavy steel prices are firm. December sheet bookings were the heaviest since March.

Car Steel Tonnage Looms Large

December freight car awards neared 13,000 when Southern Railway bought 1000 more. For these cars 130,000 to 140,000 tons of heavy steel, chiefly plates, will be required.

Pig iron production in December continued the decline which set in last May. The daily rate was 86,441 tons, against 88,728 tons in November. December total was 2,679,663 tons, compared with 2,661,863 tons in November.

From $38.07 a year ago the IRON TRADE REVIEW composite of fourteen leading iron and steel products has declined almost steadily to $35.07 this week, the loss being 8 per cent.

Pig Iron Demand Better; Prices Firm

PIG iron makers have acquired good backlogs as a result of recent heavy selling, especially in Ohio, Michigan, Indiana and Wisconsin districts. Shipping instructions are improving. The buying movement for first quarter, which developed in December, has netted furnace interests with headquarters at Cleveland approximately 320,000 tons.

Pig iron sellers in the Chicago district report the heaviest backlogs in many months. Shipping orders there for first quarter are in excess of any received in the past four or five months. December sales "represented a real buying movement for first quarter." Less than one-half the first quarter tonnage in the Chicago district remains to be placed.

The St. Louis district also has shared liberally in recent business; in the past week the Granite City blast furnace interest booked 20,000 tons, one lot of 10,000 tons for a nearby steel interest. While the past week's volume of business reported by makers at Cleveland totaled 36,000 tons, inquiries have tapered off. Selling in these districts has reflected an improved outlook in the automotive industry.

Less activity is noted in the eastern markets. The Worthington Pump & Machinery Corp. has issued inquiries for about 1000 tons for two plants.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30 to 39.30
Chicago	33.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	43.30 to 44.30

SHEET BARS

Pitts., Young., and Cleve.	$34.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh	$40.00 to 42.00
Cleveland	40.00 to 42.00
Chicago	43.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

All grades, Pittsburgh	1.80c

Standard Structural Shapes

Pittsburgh	1.80c
Philadelphia	2.07c to 2.08c
New York	2.09c to 2.14c
Chicago	1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.35c

Steel Plates

Pittsburgh	1.80c
Philadelphia	2.05c
New York	2.125c
Chicago	1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.30c to 2.40c

Iron and Steel Bars

Pittsburgh, soft steel	1.80c
Pittsburgh, cold finishing	1.95c
Pittsburgh, forging quality	2.05c
Philadelphia, soft steel	2.12c
New York, soft steel	2.14c
Chicago, soft steel	1.90c
Cleveland, soft steel, mill	1.80c
Cleveland, soft steel, del.	1.82½c and 1.99c
Birmingham, soft steel	1.95c to 2.05c
San Francisco, soft steel	2.35c
Pittsburgh, refined iron	2.75c to 4.25c
Pittsburgh, reinforcing billet	1.80c to 1.90c
Chicago, reinforcing billet	2.20c to 2.75c
Chicago, reinforc. rail steel	1.80c to 1.90c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.80c to 1.85c
Mill, rail steel	1.65c to 1.75c
Philadelphia, common iron	2.07c to 2.22c
New York, common iron	2.09c to 2.24c
Chicago, common iron	1.90c

Hoops, Bands, Strips

Hoops, Pitts., 6 in. and under	2.10c to 2.20c
Bands, Pitts., 6 in. and under	2.10c to 2.20c
Bands, Pittsburgh, over 6 in.	1.90c
Hot rolled strip, Pitts., stamping quality, over 6 in.	1.85c to 1.90c
Hot rolled strip steel, Chicago	2.10c to 2.40c
Bands, Chicago, under 6-in.	2.20c to 2.40c
Bands, Chicago, 6 in. and over	2.10c to 2.20c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pittsburgh, Cleveland (less than 3 tons)	3.00c to 3.15c
Worcester, Mass.	3.15c to 3.40c
Stripsheets, with blue annealed extras, 12 in. and wider, Pittsburgh	2.10c

Cold Finished Steel

Cold finished steel bars, drawn or rolled, Pitts., Chi., e.l.	2.20c
Steel shafting, Pittsburgh, Chicago	2.30c
Cold finished steel bars, Cleve.	2.20c

Chain, Piling, Cut Nails

Cut nails, c.l., f.o.b. mills	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.20c to 2.25c

Alloy Steel

Hot Rolled

F.o.b. Pittsburgh or Chicago
To Tonnage Users in Auto. Industry

S.A.E. Series Number	100 lbs. Bars
2100 (*½ per cent Ni. 0.10 to 0.20 per cent C)	$ 2.90 to 3.00
2300 (3½ per cent nickel)	4.00 to 4.10
2500 (5 per cent nickel)	5.00 to 5.10
3100 (Nickel chromium)	3.00 to 3.10
3200 (Nickel chromium)	4.50 to 4.75
4100 (Chromium molybdenum)	3.00 to 3.10
4100 (Cr. Mo. 0.25-0.40)	3.90 to 4.05
4615 (Ni. 1.50%; Mo. 0.10-0.20)	4.25 to 4.50
5100 (Chromium steel)	3.10 to 3.20
6100 (Cr. V., forging)	4.00 to 4.10
6100 (Cr. V., spring)	3.60 to 3.80
9200 (Silico Mang., spring steel)	3.00 to 3.20
9250 (Silico Mang., spring steel)	3.00 to 3.10
Ni. Cr. V., (Ni. 1½%, Cr. 1%, V. 0.15%)	4.00 to 4.10

*Mill number not formally accepted by S. A. E.

Hot rolled alloy billets 4 x 4-inch and over take the same prices per gross tons as same specification of alloy bars per net ton. Sizes from 4 x 4-inch down to 2½ x 2½-inch take same basis plus $5 a ton extra. Billets smaller than 2½ x 2½-inch take bar price on net ton basis.

Cold Rolled

Cold rolled alloy steels take 1c a pound extra over hot rolled when mean carbon is 0.30 or under. When the carbon is above 0.30 the extra for cold rolled is 1.75c, including annealing.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	2.75c to 2.90c
No. 24, Philadelphia, delivered	3.22c
No. 24, Gary, Indiana Harbor	2.90c to 3.00c
No. 24, Chicago, delivered	2.95c to 3.05c
No. 24, Birmingham, base	3.05c

TIN MILL, BLACK

No. 28, Pittsburgh	2.90c to 3.00c
No. 28, Gary, base	3.00c to 3.10c

GALVANIZED

No. 24, Pittsburgh base	3.60c to 3.75c
No. 24, Philadelphia, delivered	4.07c
No. 24, Gary, Indiana Harbor	3.75c to 3.85c
No. 24, Chicago, delivered	3.80c to 3.90c
No. 24, Birmingham, base	3.90c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.10c
No. 10, Philadelphia, delivered	2.42c
No. 10, Gary, Indiana Harbor	2.20c to 2.30c
No. 10, Chicago, delivered	2.25c to 2.35c
No. 10, Birmingham base	2.30c

*Plus 10 cents on material 40 inches or wider.

AUTOMOBILE

No. 28, Pittsburgh, base	4.00c to 4.15c

IRON

No. 10, Pitts., blue ann., c.l.	2.90c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.85c
No. 24, Pitts., gal., c.l.	4.85c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.10c

*Prices subject to quantity differentials.

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.o.b. Cleveland and Pittsburgh base

Bright plain wire, No. 9 gage	2.35c to 2.40c
Annealed fence wire	2.50c to 2.55c
Galvanized wire, No. 9 gage	2.95c to 3.00c
Barbed wire, painted	2.95c to 3.00c
Barbed wire, galvanized	3.20c to 3.25c
	Per 100 lbs.
Wire nails	$2.45 to 2.55
Galvanized nails	4.45c to 4.50c
Polished staples	2.90c to 3.00c
Galvanized staples	3.15c to 3.25c
Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra, base	2.45c to 2.55c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relay, rails, Pitts. 60 to 70 lb.	25.00 to 27.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.70c to 2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts. stand	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	2.25c

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents for carloads or six 5 per cents for less-carload on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal two 10 per cents to two 10 and one 5 per cents.

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Six-inch and over, Birming'm	$29.00 to 30.00
Four-inch, Birmingham	33.00 to 34.00
Four-inch, Chicago	40.20 to 42.20
Six-inch to 24-inch, Chicago	36.20 to 38.20
Four-inch, New York	40.25 to 41.60
Six-inch and over, New York	37.25 to 38.25
Standard fittings, Bir. base	$100.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

Bolts and Nuts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927. Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Eagle list	70 off

MACHINE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Lag screws	70 off
Plow bolts, Nos. 1-2-3-7 heads	70 off
Tap bolts	70 off
Blank bolts	70 off
Stud bolts without nuts	70 off

Stove bolts, 80-10-5 off in packages; 80-10-5 with 2½ off in bulk.

Tire bolts	60-5 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in. diam. and smaller	85-5 off

SQUARE HEAD SET SCREWS

Milled	80-10 off
Upset, 1-in. diam and smaller	80-10-10 off

Rivets

Structural rivets, carloads Pittsburgh and Cleveland	2.75c
Structural rivets, c.l., Chicago	2.85c to 3.10c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland and Chicago 70 and 10 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Wrought, c.l., Pitts. dist.	$6.75 off
Lock washers (dealers')	85-5 off
Lock washers (consumers)	85 off

Demand for low phosphorus iron has picked up; one Pittsburgh consumer has placed 1000 tons and another is in the market for 500 tons. The Norfolk & Western railway is in the market for 600 tons of foundry iron. The surplus foundry iron stocks in Alabama are reported 20 per cent heavier at this time than a year ago.

Prices exhibit a firmer tendency in most districts, but are quotably unchanged from a week ago. One or two sales of foundry iron have carried a price of $17.50, base, valley, though $17.25 generally is available. Basic is nominal at $17, valley. The Chicago price of foundry iron is firm at $18.50, base.

Bars Specified Heavily at Low Prices

Consumers of soft steel bars closed the year with an unusual volume of specifications against contracts. At Chicago they were at double the rate of the preceding December. At other points they were 25 per cent above November. This activity was fostered by low prices on fourth quarter business and a higher level for this year. In spite of this it does not appear that consumers have overbought or covered for more than legitimate needs. Contracts for first quarter at higher prices have not brought out specifications. Automotive and farm implement demand is continuing well and promises good tonnage. Mills at Pittsburgh have increased operations slightly. Sellers are holding to the higher quotations announced for first quarter and differentials under the price are being resisted strongly. Efforts to buy under 1.80c, Pittsburgh, have been unavailing.

Sheet Bars Shade Easier in Some Markets

Specifications for billets, slabs and sheet bars have improved, due to betterment in sheet and strip steel manufacture. Sales, however, continue small. A few users now are arranging for their January requirements. Billets and slabs carry the $33, Pittsburgh, price, and while the $34 quotation on sheet bars apparently is firm, it sometimes represents the delivered price which means a minimum of $33.50 at makers' plants. Forging billets will move more rapidly against first quarter contracts after inventories are out of the way. The price is $38, Pittsburgh. Little has been done on new $42 wire rod contracts, because shipments during December were heavy on $40 and $41 contracts. Skelp is 1.80c, Pittsburgh, for first quarter.

Tin Plate Stocks Heavy

Tin plate specifications are fairly active, though canmakers and others enter the new year with much larger inventories than in January, 1927. The trade is certain, however, that such accumulations will be easily disposed of when the container manufacturers accelerate the making of cans for food packs. The American Sheet & Tin Plate Co. gained several points in its operating schedule, going to 72 per cent last week. The general average is 65 to 70 per cent. The price at $5.25 is held firmly, despite efforts of certain buyers to claim concessions.

Pig Iron Prices

Per gross ton

Bessemer, valley furnace	$17.50
Bessemer, del. Pittsburgh	19.26
Basic, valley furnace	17.00
Basic, del., Pittsburgh	18.76
Basic, Buffalo furnace	16.50 to 17.00
Basic, del., eastern Pa.	19.25 to 19.75
Malleable, valley furnace	17.25 to 17.50
Malleable, del. Pittsburgh	19.01 to 19.26
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	17.50
Malleable, del. eastern Pa.	20.00 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	20.76 to 21.26
No. 1X, Buffalo furnace	18.00 to 18.50
No. 2 foundry, valley furnace	17.25 to 17.50
No. 2 foundry, del., Pittsburgh	19.01 to 19.26
No. 2 fdy., Everett, Mass., fur.	19.00 to 21.00
No. 2 foundry, Buffalo furnace	17.00
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 foundry, del. Phila.	19.76 to 20.26
No. 2 Virginia furnace	20.50
No. 2 foundry, N. J., tidewater	19.28 to 21.26
No. 2 foundry, east N. Y. fur.	18.00 to 20.50
No. 2 Alabama, Birmingham	16.00
No. 2 Alabama, del. Cincinnati	19.69
No. 2 Tenn., Birmingham base	16.00
No. 2 Tenn., del., Cincinnati	19.69
No. 2 Alabama, del. Philadelphia	22.01
No. 2 Alabama, del. Chicago	22.01
No. 2 Ala., del. Chicago, river-rail	20.18
No. 2 Ala., del. Boston, rail-water	22.91 to 24.77
No. 2 Alabama, del. Cleveland	22.01
No. 2 Alabama, del. St. Louis	20.42
No. 2X east, N. J., tidewater	19.78 to 21.76
No. 2X, eastern, del. Phila.	20.26 to 20.76
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern, del. Boston	23.15 to 23.65
No. 2X, Virginia furnace	20.50 to 21.00
No. 2X, Virginia, del. Phila.	25.04 to 25.54
No. 2X, Virigina, del. Jersey City	25.37 to 25.87
No. 2X, Virginia, del. Boston	25.71 to 26.21
Gray forge, val., del., Pittsburgh	18.51 to 18.76
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76 to 27.79
Low phos., copper bearing fur.	23.00 to 24.00
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron, Jackson county (Ohio) furnace, in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents; 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Sheet Mills Begin Year with Good Backlogs

Sheetmakers enter the new year with excellent backlogs although it is admitted prices are far from satisfactory. The American Sheet & Tin Plate Co. expects that when final compilation for December bookings are made, that month will prove to be the second largest of 1927, or practically up to March. Full finished sheetmakers have endeavored to sidestep commitments over the entire first quarter at 4.00c, Pittsburgh, but have taken many prompt orders at that level. Some quote 4.15c for extended delivery. Black sheets are 2.80c to 2.90c, Pittsburgh, the 2.75c price having practically disappeared. Galvanized sheets are quotable at 3.65c to 3.75c. Makers of blue annealed sheets have taken a firmer stand at 2.10c.

In the Chicago district, mill plans call for operations at 60 to 70 per cent early in January. Strip steel competition continues keen against small gage blue annealed sheets. Demand for blue annealed is active from tank and drum manufacturers. Chicago delivered prices are holding at 2.95c to 3.05c for No. 24 black, 3.80c to 3.90c for No. 24 galvanized, and 2.25c to 2.35c for No. 10 blue annealed.

Plate Bookings Improve

The new year opens with sellers of plates in a much more advantageous position than a year ago. Specifications have been heavy and first-quarter contracts reflect possibility of an advance beyond 1.80c, Pittsburgh. The 30 Boston & Maine locomotives booked by the Lima Locomotive Works call for a good tonnage of plates. Orders for Great Lakes ship repair plates have been fair. Penstock Construction Co., Sharon, Pa., is low bidder on 18,000 feet of 60-inch pipe line for Newark, N. J., involving about 3000 tons of plates. Penstock's bid covers riveted pipe.

Pontoons for United States engineers at Memphis, Tenn., with some riveted pipe for the same destination, will take 500 to 600 tons instead of 1600 tons, as originally reported. A prospective inquiry for 30 standard river barges has been issued by Union Barge Line, Pittsburgh, which has awarded 1000 tons for two towboats to the Midland Barge Co. Specification for plates for oil tanks in the Chicago district were liberal as the year closed. Fourth quarter contracting was active on the basis of 1.90c, Chicago.

Wire Orders Are Large

Makers of wire and nails close the year with first quarter contracts well in hand at 2.40c, Pittsburgh, for wire and $2.55 for nails. Lower prices which have applied in recent weeks are expected to disappear with the new year. Specifications at these lower prices have been filed in large volume and may be sufficient to cover requirements for one month of first quarter. Higher prices have not been tested by specifications but are expected to stand. Production remains 50 to 55 per cent of capacity with signs of immediate increase to 60 per cent to meet orders. Some makers found December bookings equal to those of the same month in 1926. The new card of extras is being applied to all new business.

Bolts, Nuts Well Bought

Consumers of bolts and nuts enter the year with 70 to 75 per cent of their first quarter requirements covered. Specifications in late December were light, to limit inventories. Production is about 50 per cent, with prospects for an early increase. Prices are firm at 70 off for nuts and bolts, with 60 off for small quantities and 2.75c, Pittsburgh, for large structural rivets. Specifications for rivets are heavier from structural and railroad car shops. Small rivets are 70 and

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Jan. 4, 1928	Dec. 1927	Oct. 1927	Jan. 1928
PIG IRON				
Bessemer, valley, del., Pittsburgh	$19.26	19.36	19.76	21.26
Basic, valley	17.00	17.00	17.00	18.50
Basic, eastern del., eastern Pa.	19.50	19.25	19.50	21.25
*No. 2 foundry, del., Pittsburgh	19.01	19.01	19.26	20.21
No. 2 foundry, Chicago	18.50	18.50	18.75	20.00
*Southern No. 2 Birmingham	16.00	16.00	17.25	18.50
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	19.90
**No. 2X, Virginia furnace	20.50	20.75	21.50	21.75
**No. 2X, eastern, del. Phila.	20.26	20.26	20.66	22.76
Malleable, valley	17.25	17.35	17.50	18.50
Malleable, Chicago	18.50	18.50	18.75	20.00
Lake Superior charcoal, del., Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del., Pittsburgh	18.51	18.56	18.76	19.71
Ferromanganese, del., Pittsburgh	104.79	104.79	94.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.75	2.60	2.85	3.35
Connellsville, foundry, ovens	3.75	3.60	3.75	4.25
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	34.00	34.00	34.00	36.00
Sheet bars, open-hearth, Pittsburgh	34.00	34.00	34.00	36.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh	40.00	40.00	42.50	45.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.80	1.80	1.75	1.95
Steel bars, Chicago	1.90	1.90	1.85	2.10
Steel bars, Philadelphia	2.12	2.12	2.07	2.22
Iron bars, Philadelphia	2.07	2.07	2.07	2.22
Iron bars, Chicago	1.90	1.90	1.90	2.00
Shapes, Pittsburgh	1.80	1.80	1.75	1.95
Shapes, Philadelphia	2.08	2.08	2.07	2.22
Shapes, Chicago	1.90	1.90	1.85	2.10
Tank plates, Pittsburgh	1.80	1.80	1.75	1.90
Tank plates, Philadelphia	2.05	2.05	2.07	2.22
Tank plates, Chicago	1.90	1.90	1.85	2.10
Sheets, black, No. 24, Pittsburgh	2.75	2.75	2.95	2.95
Sheets, blue anl., No. 10, Pittsburgh	2.10	2.10	2.15	2.25
Sheets, gal., No. 24, Pittsburgh	3.60	3.60	3.80	3.80
Sheets, black, No. 24, Chicago	2.95	2.95	3.10	3.15
Sheets, blue anl., No. 10, Chicago	2.25	2.25	2.35	2.40
Sheets, galvanized, No. 24, Chicago	3.80	3.80	3.95	4.00
Wire nails, Pittsburgh	2.45	2.45	2.55	2.65
Wire nails, Chicago	2.55	2.50	2.60	2.70
Tin plate per base box, Pittsburgh	5.25	5.25	5.30	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	15.50	14.95	14.50	17.00
Heavy melting steel, eastern Pa.	14.00	14.00	14.00	15.60
Heavy melting steel, Chicago	12.25	11.95	11.75	13.20
No. 1 wrought, eastern Pa.	15.75	15.75	15.75	17.00
No. 1 wrought, Chicago	12.65	11.25	11.40	14.20
Rails for rolling, Chicago	15.00	14.00	14.70	16.00

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Jan. 4, 1928)	**$35.07**
Last week (December 28, 1927)	**35.07**
One month ago (December, 1927)	**35.09**
Three months ago (October, 1927)	**35.67**
One year ago (January, 1927)	**37.68**
Ten years ago (January, 1918)	**56.67**
Fourteen years ago (January, 1914)	**23.03**

10 off, with an extra 5 per cent sometimes granted on attractive business.

Coke Is Affected by Wage Scale Adjustments

Competition in wage scales instead of the usual competition in selling prices is the condition of the beehive coke market as the new year starts. Some small bituminous coal mines in western Pennsylvania outside of the coke region have cut wages to $4.50 a day, and in the Fairmont, W. Va. territory $4 has been reached in some cases. Nothing definite has been heard with reference to the H. C. Frick Coke Co. going from $7 to a $6 scale, but this is a possibility. Contracting for coke is over until more furnaces go into blast. Foundry coke shows more activity, with the reduction of wage scales serving to clarify the price situation somewhat, and $3.75 to $4.25 now are the more common quotations. Production of coke in the Connellsville region in the week ending Dec. 24 was 42,360 tons, compared with 41,460 tons in the preceding week, according to the *Connellsville Courier*. December by-product coke prices are being reaffirmed for January in some districts.

Strip at Low Price

Strip shipments, both hot and cold, have been fairly heavy but they have applied against low priced contracts. Especially in hot strips, some low prices will continue to apply through the quarter, several customers being protected. From 3.00c to 3.15c is quoted on cold strips (up to 3 tons) which means 2.75c on carloads or more. Low figures, such as 1.85c and 1.90c on wide hot strips are dying hard, although some makers claim to be booking occasionally at the official 2.10c price. These note some hoop and band sales at the official 2.30c level, while others have had to go as much as $4 under that to get business.

Heavier hot and cold-rolled strip steel tonnage is coming out in the Chicago district, chiefly from automotive builders or parts makers. Prices still show weakness inasmuch as specifications on low-price contracts are being worked off. New bookings are obtaining stronger prices. Buyers of narrow sizes of hot-rolled strip have obtained as low as 2.20c, or a drop of $2 a ton, from the recent 2.30c minimum. For the wider sizes 2.10c to 2.20c is obtained. Cold-rolled strip continues 3.00c to 3.15c, Pittsburgh and Cleveland, for orders of less than three tons each.

Coke Prices

Beehive Ovens	
Prices per Net Ton	
Connellsville furnace	$2.75 to 3.00
Connellsville foundry	3.75 to 4.75
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county, foundry	5.00
Wise county, furnace	4.50
Alabama foundry	5.50
By-Product	
Foundry, Newark, N. J., del.	9.59 to 10.77
Foundry, Chicago, ovens	9.00
Foundry, New England, del.	11.50
Foundry, St. Louis	9.75
Foundry, Birmingham	5.00
Foundry, Indianapolis, del.	9.75
Foundry, Ashland, Ky.	7.50
Foundry, Portsmouth, O.	7.50
Foundry, Detroit, ovens	9.00
Foundry, Buffalo, ovens	9.00

Cold Finished Active

Customers of cold bar finishers were given until Dec. 31 to specify on fourth quarter contracts at 2.10c and bookings for January shipment are heavy. Makers believe the volume is not sufficient to indicate speculative buying. Shipments will show considerable increase this month over last, December being 20 to 30 per cent greater than November. Operations were increased commensurately and now average 60 per cent, with 70 per cent in early view. Specifications received after Jan. 2 carried 2.20c, with the new card of extras applying. So far, these have been scarce. With but one or two possible exceptions, all consuming lines are active, led by the automotive trade.

Gas Line Jobs to Mature

Action on the larger lots of gas line pipe pending at Pittsburgh is expected this month. Jobber specifications for pipe have been slim, due to a desire to hold down inventories, but should increase now. Spring building programs promise good orders for full weight merchant pipe.

Contractors at Chicago are placing small lots of cast iron pipe, taking advantage of present low prices. No sales are booked at less than $28, Birmingham, for 6-inch and over, with up to $30 done. Makers have fairly heavy stocks and are booked well into January.

Westfield, Mass., has placed 100 tons

of cast pipe with Warren Foundry & Pipe Co. R. D. Wood & Co. are low on 400 tons for Worcester, Mass. The 1800 tons for Boston still is pending.

Sellers Regain Control of Scrap Market

Consumer buying of iron and steel scrap is light, in small lots. Consumers are deferring large buying until the price situation clears. Offers to buy are lower than dealers' ideas of price and offers to sell are higher than consumers' ideas. Some lots for current needs are moving, principally heavy melting steel, which is commanding a higher price. Prices tend upward as dealers accumulate stock in readiness for the buying movement confidently expected to develop early in January. Sellers have the advantage at the moment, in contrast to recent conditions. High prices paid for railroad tonnages indicate faith by dealers in a rising market, to make good their investments by the time deliveries are started. Sufficent tonnage is coming out from railroad sources to make the situation easy and to provide for future demand. Heavy melting steel at Pittsburgh is $15.50 to $15.75 and at Chicago $12.25 to $12.75.

Ferromanganese Firm

It is estimated 50 per cent of first half requirements of ferromanganese have been placed on makers' books. The price in all instances is $100, duty paid, tidewater. Specifications on $90 second half contracts continued heavy during the last few days of December, and producers were forced to set a limit on them.

The spiegeleisen market continues $32, furnace, for 19 to 21 per cent. This price has been done on a few spot carloads. The $30 and $31 prices which recently were done on spot carloads seem to have disappeared in connection with such quantities. Large contracts for first quarter and first half were accepted at those prices some weeks ago, but this business now is out of the way and on the basis of current transactions $32 is the minimum.

Metal Prices Are Holding

Seasonal dullness prevails in the nonferrous metal market, but prices are steady. Export buying featured in copper and while domestic demand was lacking the market held unchanged at 14.00c to 14.12½c, delivered Connecticut. Lead was a little more active but unchanged at 6.50c, New York, and 6.32½c to 6.35c, East St. Louis. Some inquiry for zinc was out but actual trading was limited. The zinc price, however, held unchanged all week at 5.62½c, East St. Louis. Tin was steady around 58.00c, fluctuating in a narrow range. The situation in aluminum is hazy, as importers' quotations are nominal pending advices from producers abroad. The leading producer of nickel this week cut the price of electrolytic, 99.90 per cent nickel, 2 cents to 37.00c. Other nickel prices were unchanged.

Railroad Equipment In Continued Activity

Activity in the railroad equipment market, started several weeks ago with large inquiries, continues undiminished. Southern Railway has placed an additional 1000 cars, bringing its recent placement to 5500, and advancing the total of freight car awards in December to approximately 13,000. Atchison, Topeka & Santa Fe placed an additional 500 ballast cars, increasing its order of 3650, noted last week, to 4150.

Rail tonnage closed in the Chicago district amounted to about 20,000 tons during the week, with track accessory awards of 10,000 to 12,000 tons. Rail mills have expanded operations to about 75 per cent, and track fastenings production averages 60 per cent.

Prospective business includes a definite inquiry for 4000 miscellaneous freight cars by the St. Louis-San Francisco, in addition to 2000 refrigerator cars for the Pacific Fruit Express, noted last week. Minneapolis, St. Paul & Sault Ste. Marie plans a $6,000,000 expenditure in 1928 for rolling stock, track fastenings and rails.

CAR ORDERS PLACED

Atchison, Topeka & Santa Fe, 76 miscellaneous passenger cars, to Pullman Car & Mfg. Corp. and 500 ballast cars to Rodgers Ballast Car Co., in addition to 3650 cars recently placed.

Southern Railway, 1000 freight cars, as follows: 500 gondolas and 250 caboose cars to Lenoir Car Co., a subsidiary; and 250 ballast cars to the Rodgers Ballast Car Co., making recent freight car total 5500.

CAR ORDERS PENDING

Illinois Central, 20 suburban coaches.

Louisville & Nashville, 16 miscellaneous coaches, to American Car & Foundry Co.

St. Louis-San Francisco, 4000 miscellaneous freight cars, in addition to inquiry for 15 baggage and mail cars and five baggage cars; previously noted as contemplated, definite inquiry out.

Swift & Co., 300 refrigerator underframes.

Jobbers Await New Year

With December sales exceeding expectations in many instances, iron and steel jobbers await with interest anticipated heavy buying in January. Stocks of consumers have been reduced to a minimum at the inventory season, and following renewal of operations in many plants shut down for the holidays, jobbers expect a sharp improvement in demand in January. Building material demand generally has been slack, with little signs of improvement until well into the first quarter. Manufacturing demand, especially for bars, has been better in the East, while sheets have been fairly active in the Chicago district.

Warehouse prices continue to evidence firmness, with no price alterations expected for the first quarter, despite rumors of mill increases. Jobbers generally have held their quoted levels more stable in recent months and revisions are less apt to follow any changes in mill bases.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$100.00
Ferromanganese, del., Pittsburgh	104.79
Spiegeleisen, 19 to 21 per cent domestic furnace	32.00
Ferrosilicon, 50 per cent, freight allowed, 1928 contracts, carloads	83.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Ferrotungsten stand. lb. cont.	95.00
Ferrovanadium, 30-40 per cent, per lb,. contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18%)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala., (24 per cent)	122.50

Structural Market Faces Heavy Buying

With inquiry involving single projects requiring as high as 50,000 tons each, structural mills and fabricators are looking forward to a season of heavy buying when spring building programs materialize. Awards of the week were featured by the 14,000-ton letting in Chicago of the *Daily News* building to American Bridge Co. Most other awards were small. Plain material prices are firm at 1.80c, Pittsburgh, and 1.90c, Chicago, with most large consumers contracted ahead for first quarter requirements.

CONTRACTS PLACED

14,000 tons, *Daily News* building, Chicago, to American Bridge Co.

9000 tons, for Fulton street tunnel, New York, to American Bridge Co.

600 tons, brick shed for Bohnsack Brick Co., Chicago, to Midland Structural Steel Co. and Blaw-Knox Co.

325 tons, highway bridge for Henry county, Iowa, to Clinton Bridge Co.

300 tons, pathological unit of University hospitals project, Cleveland, to unstated fabricator.

250 tons, highway bridge for Johnson county, Iowa, to Des Moines Steel Co.

1500 tons, Lincoln high school, Milwaukee, to Wagner Architectural Iron Works.

1500 tons, foundry for Ford Motor Co., Detroit, to Worden-Allen Co.

200 tons, building for Ohio River Edison Co., Toronto, O., through Stevens & Wood, general contractors, to Jones & Laughlin Steel Corp.

Total ..... 27,425 tons

CONTRACTS PENDING

2000 tons, Lamson store building, Toledo, O.; bids in Dec. 31.

2500 tons, apartment hotel at Burton place and Lake Shore drive, Chicago; plans prepared.

4300 tons, F. W. Woolworth Co. building at State and Washington streets, Chicago; steel bids being received.

500 tons, industrial storage building at Anderson, Ind.; plans prepared.

7000 tons, Forman Bank building, Chicago; plans prepared.

25,000 tons, warehouse and wholesale store for Marshall Field & Co., Chicago, previously noted as including a larger tonnage.

2500 tons, third unit of Capitol building, Omaha, Nebr.

10,000-Ton Award Leads Concrete Bar Sales

Featuring the concrete bar activity of the past week was the closing of a 10,000-ton contract for the substructure of a viaduct between San Mateo and Alameda, Calif., the award going to Bethlehem Steel Co. Numerous large tonnage projects are pending, but awards of the week were confined largely to the 10 to 40-ton variety. Prices on new billet bars

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons Delivered to Consumers

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 10.75
Boston (dealers)	9.00 to 9.25
Buffalo, No. 1	14.50 to 15.00
Buffalo, No. 2	13.75 to 14.25
Chicago	12.25 to 12.75
Cincinnati (dealers)	11.25 to 11.75
Cleveland, No. 1	13.50 to 14.00
Cleveland, No. 2	13.25 to 13.50
Detroit, No. 1	11.25 to 11.75
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania, No. 2	10.50 to 11.50
Bethlehem delivery	13.00 to 13.50
New York (dealers) (railroad)	10.00 to 10.85
New York (dealers) (yard)	7.00 to 7.50
Pittsburgh, No. 1	15.50 to 15.75
St. Louis	12.25 to 12.75
Valleys, No. 1	14.75 to 15.00

COMPRESSED SHEETS

Buffalo	11.50 to 12.00
Chicago	11.00 to 11.50
Cleveland	12.50 to 13.00
Detroit	10.25 to 10.75
Pittsburgh	14.25 to 14.75
Valleys	14.00 to 14.25

BUNDLED SHEETS

Buffalo	8.75 to 9.25
Cincinnati (dealers)	9.50 to 10.00
Cleveland	11.50 to 12.00
Eastern Pennsylvania	10.50 to 11.00
Pittsburgh	13.00 to 13.50
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	9.00 to 9.50
Detroit	7.75 to 8.25
St. Louis	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Buffalo	16.00 to 16.50
Chicago	15.00 to 15.50
Cincinnati (dealers)	16.00 to 16.50
Detroit	11.00 to 11.50
St. Louis	15.25 to 15.75

STOVE PLATE

Birmingham	13.00 to 14.00
Boston (consumers)	11.00 to 11.50
Buffalo	12.75 to 13.25
Chicago (net)	12.00 to 12.50
Cincinnati (dealers) net	9.50 to 10.00
Cleveland	12.00 to 12.50
Detroit (net tons)	10.50 to 11.00
Eastern Pennsylvania	12.50
New York (dealers) (mill)	8.25 to 8.50
Pittsburgh	12.50 to 13.00
St. Louis	13.50 to 14.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.50 to 17.00
Cincinnati (dealers)	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.50
Pitts. billet and bloom crops	19.00 to 19.50
Cleveland, billet and bloom crops	17.00 to 17.50

SHOVELING STEEL

Chicago	12.25 to 12.75
Pittsburgh	11.50 to 11.75
St. Louis	12.25 to 12.75

KNUCKLES, COUPLERS, SPRINGS

Chicago	14.25 to 14.75
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	17.25 to 17.50
St. Louis	14.00 to 14.50

FROGS, SWITCHES, GUARDS

Chicago	13.75 to 14.00
St. Louis	14.25 to 14.50

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	14.50 to 15.00
St. Louis, No. 2	13.00 to 13.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	10.00 to 10.50
Buffalo, No. 1	12.25 to 12.75
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	12.65 to 13.15
Chicago, No. 2	12.25 to 12.75
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	15.50 to 16.00
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	12.50 to 13.00
Pittsburgh, No. 2	15.50 to 15.75
St. Louis, No. 1	11.00 to 11.50
St. Louis, No. 2	12.25 to 12.75

WROUGHT PIPE

Boston (dealers)	7.50 to 8.00
Eastern Pennsylvania	11.50 to 12.50
Buffalo	12.00 to 12.50
New York (dealers)	8.75 to 9.25

YARD WROUGHT

Boston	8.50 to 9.00
Eastern Pennsylvania	15.00 to 15.50

BUSHELING

Buffalo	12.00 to 12.50
Chicago, No. 1	10.75 to 11.25
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Cincinnati, No. 2	7.00 to 7.50
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	10.50 to 11.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.25
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati (dealers)	8.50 to 9.00
Cleveland	9.00 to 9.25
Detroit	7.25 to 7.75
Eastern Pennsylvania	11.00
New York (dealers)	7.00 to 7.50
Pittsburgh	11.50 to 11.75
St. Louis	6.25 to 6.75

CAST IRON BORINGS

Birmingham (chemical)	13.00 to 13.50
Birmingham plain	8.00 to 9.00
Boston (chemical)	9.50 to 10.00
Boston (dealers)	6.50 to 7.50
Buffalo	10.00 to 10.50
Chicago	10.00 to 10.50
Cincinnati (dealers)	8.75 to 9.25
Cleveland	10.50 to 10.75
Detroit	8.75 to 9.25
Eastern Pennsylvania	11.00
Eastern Pennsylvania (chem.)	15.00 to 15.50
New York (dealers)	6.75 to 7.35
Pittsburgh	11.50 to 11.75
St. Louis	9.50 to 10.00
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	6.00 to 6.25
Buffalo	10.00 to 10.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.50 to 10.75
Detroit	8.75 to 9.25
Eastern Pennsylvania	10.00 to 11.00
New York (dealers)	6.75 to 7.35
Pittsburgh	11.50 to 11.75

PIPES AND FLUES

Chicago (net)	7.50 to 8.00
Cincinnati (dealers)	7.75 to 8.25
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	10.50 to 11.00
Chicago (net)	11.50 to 12.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.50
New York (dealers)	8.25 to 8.75
St. Louis	12.00 to 12.50

FORGE FLASHINGS

Boston (dealers)	6.00 to 6.50
Buffalo	11.00 to 11.50
Chicago	9.50 to 10.00
Cleveland (over 10 in.)	12.50 to 13.00
Detroit	9.50 to 10.00
Pittsburgh	13.50 to 14.00

FORGE SCRAP

Boston (dealers)	6.00 to 6.50
Chicago	15.25 to 15.75
Eastern Pennsylvania	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago (net)	18.00 to 18.50
St. Louis	21.00 to 21.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	13.50 to 14.00
Chicago	10.25 to 10.75
Cleveland	12.00 to 12.25
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	14.00 to 14.50
St. Louis	9.00 to 9.50

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	16.00 to 17.00
Buffalo	16.50 to 17.00
Chicago	17.90 to 18.50
Cleveland	16.00 to 16.50
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	18.50 to 19.00
St. Louis	20.00 to 20.50

SHAFTING

Boston (shipping point)	13.00 to 13.50
Chicago	16.80 to 17.35
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	14.00 to 15.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	13.75 to 14.25
Buffalo, steel	15.25 to 15.75
Chicago, iron	13.50 to 14.00
Chicago, rolled steel	15.50 to 16.00
Cincinnati	12.75 to 13.25
Eastern Pennsylvania	15.00 to 16.00
New York iron (dealers)	12.00
Pittsburgh, iron	14.75 to 15.25
Pittsburgh, steel	17.25 to 17.50
St. Louis, iron	14.00 to 14.50
St. Louis, steel	14.50 to 15.00

NO. 1 CAST SCRAP

Birmingham, cupola	14.00 to 14.50
Boston	14.50 to 15.50
Buffalo	14.00 to 14.50
Chicago, No. 1 machinery	15.75 to 16.25
Chicago, No. 1 railroad	14.55 to 15.10
Chicago, No. 1 agricultural	14.55 to 15.10
Cincinnati No. 1 machinery cupola (net tons dealers)	14.50 to 15.00
Cleveland, cupola	16.50 to 17.00
Detroit (net tons)	12.50 to 13.00
Eastern Pennsylvania (cupola)	16.50 to 17.00
New York, cupola (dealers)	13.00 to 13.50
Pittsburgh, cupola	14.50 to 15.00
San Francisco, delivered	20.00 to 21.00
Seattle	15.50 to 15.75
St. Louis, railroad	14.00 to 14.50
St. Louis, agricultural	13.25 to 13.75
St. Louis, machinery	15.75 to 16.25
Valleys	16.50 to 17.00

HEAVY CAST

Boston	15.00 to 15.50
Buffalo (breakable)	11.50 to 12.00
Cleveland	12.50 to 12.75
Detroit (automobile) (net tons)	18.50 to 19.50
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.75 to 12.00
Pittsburgh	13.00 to 13.50

MALLEABLE

Boston, railroad	13.50 to 14.00
Buffalo	14.50 to 15.00
Chicago, agricultural	11.75 to 12.25
Chicago, railroad	13.25 to 13.75
Cincinnati, railroad (dealers)	12.00 to 12.50
Cincinnati, agricultural (dealers)	11.00 to 11.50
Cleveland, agricultural	15.00 to 15.50
Cleveland, railroad	15.50 to 16.00
Detroit, auto	13.00 to 13.50
Pittsburgh, railroad	14.50 to 15.00
St. Louis, agricultural	12.50 to 13.00
St. Louis, railroad	12.25 to 12.75

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.50 to 14.00
Boston (dealers)	10.00 to 10.50
Buffalo	14.25 to 14.75
Chicago	15.00 to 15.50
Eastern Pennsylvania	16.00
New York	11.00 to 12.00
Pittsburgh district	16.50 to 17.00
St. Louis	15.50 to 16.00

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	15.50 to 16.00
St. Louis, No. 1	14.00 to 14.50

LOW PHOSPHORUS PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	16.50 to 17.00

are steady at 1.80c, Pittsburgh, and 2.20c, Chicago, with no definite changes as yet for first quarter spot business.

CONTRACTS AWARDED

10,000 tons, substructure for viaduct between San Mateo and Alameda, Calif., through Raymond Concrete Piling Co., New York, contractor, to Bethlehem Steel Co.
500 tons, rail steel, superstructure for Medinah Athletic club, Chicago, to Inland Steel Co.
300 tons, grain elevator for Chicago & North Western railroad at Council Bluffs, Iowa, to Olney J. Dean & Co.
250 tons, North Side Y. W. C. A., Chicago, to Olney J. Dean & Co.
300 tons, warehouse for Stix, Baer & Fuller Co., St. Louis, to the Missouri Rolling Mills Corp.
Total awards ..... 11,850 tons

CONTRACTS PENDING

3000 tons, plant building for Campbell Soup Co., Chicago; plans being revised.
745 tons, building for Meyer-Mervis Co., Twenty-second and Fisk avenue, Chicago.
225 tons, Union station, Texarkana, Tex.
175 tons, substructure for Medinah Athletic club, Chicago; Paschen Bros., Chicago, general contractors.
100 tons, paving for Boulevard of the Allies extension, Pittsburgh; general contract awarded Booth & Flinn Ltd.
100 tons, building for Croatian Fraternity association, Pittsburgh; bids in Jan. 6.
100 tons, water treating plant, Sewickley, Pa.; bids about to be asked.

European Markets Quiet

London, Dec. 31.—(*By Cable*)—British iron and steel markets are quiet due to the holiday period. The outlook for heavy steelworks is unfavorable, orders being scarce. The tin plate market is more encouraging. The Belgian markets are quieter, peak prices apparently having been reached. Paris reports markets firmer, and outlook brighter. German business is quiet. A satisfactory solution to the German steelworks labor crisis is expected.

Will Act on Tool Inquiry

Chicago machinery sellers have a fair number of inquiries active as the year opens. A Milwaukee road machinery builder is expected to re-equip his machine shop. The Studebaker Corp. inquiry may be revived. Several more western railroads are expected to enter the market.

At Pittsburgh, the Westinghouse Electric & Mfg. Co. should act soon. Most recent sales have been of the single tool variety. Crane demand has been slack.

Iron Ore Is Placed

Books for 1928 have not been opened by Lake Superior iron ore producers, but interest is shown by some consumers. American Radiator Co. is reported to have closed with a Minnesota iron ore sintering company for 70,000 tons annually for the next three years. Prices for standard grades of ore for 1928 have not been determined, but producers do not expect any change from 1927.

Starts Reduction Plant

After many months of preparation the experimental iron ore reduction plant for producing granular iron direct from Lake Superior ore at the Lorain, O., division of the National Tube Co. now is in operation. Approximately 200 tons of metal is being made daily.

Valley Operations are Showing Gain

Youngstown, O., Jan. 3.—Six additional open hearths are active among independent steelmakers in this district this week, making 39 furnaces active out of 53. Independent sheet units active number 100 out of 127. Pipe, strip and tin plate operations are well maintained, and steel bar orders are gaining. General independent steel operations in this district are 70 per cent, while Carnegie Steel Co. mills in the district hold at 55 per cent.

Orders By-Product Ovens

The contract to erect an $8,000,000 by-product coke oven plant in Philadelphia to increase by 25 per cent the supply of gas furnished to the city is regarded as substantially killing the project to build a blast furnace plant. The new coke plant is to be located at Nicetown,, in North Philadelphia on a site which does not have adequate space for the erection of a blast furnace plant. Under the arrangement specified in the contract 200,000 tons of by-product coke annually and 18,000,000 cubic feet of gas daily is to be furnished to the United Gas Improvement Co. This will leave a surplus of about 300,000 tons of by-product coke which will be marketed in this territory principally in connection with the domestic heating and foundry coke trades.

Bethlehem Report Ready

Washington, Jan. 3.—The board of review of the federal trade commission has completed its report on the Bethlehem Steel Co. merger complaint. The commission will consider the report at the next meeting, but final action may be distant. The new eastern mill basing points affect the case.

Dominion Well Booked

The plant of the Dominion Iron & Steel Co. at Sydney, N. S., is now operating at capacity and has sufficient orders to keep it so until June, according to H. J. Kelly, general manager. The plant now is rolling 65,000 tons of rails for the Canadian National Railways, and has booked an order for 11,600 tons for the New York Central.

Improvements Authorized

An extension of 320 feet will be made to the No. 4 wire mill at the Roebling, N. J. division of the John A. Roebling's Sons Co. and at the same plant galvanizing capacity will be increased. At the Trenton division a physical laboratory will be erected and a wire rope testing machine having a capacity of 2,000,000 pounds will be installed. The company recently completed a cleaning house, added wire drawing benches, rebuilt heavy wire drawing benches in wire mill No. 1, and installed tempering and galvanizing machinery at the Roebling, N. J. works; and, completed a new tinning shop, installed high-speed stranders and built a general office and stores building at the Trenton, N. J. works.

B. F. Jones Jr. is Dead

Pittsburgh, Jan. 3.—B. F. Jones Jr., chairman of the board of the Jones & Laughlin Steel Corp., died at his home here Jan. 1 after an illness of less than two weeks. Mr. Jones, son of the founder of the corporation, was born April 21, 1868, in Allegheny. Following his graduation from Princeton university in 1891, he became treasurer and a member of the board of managers of Jones & Laughlins, Ltd. Four years before the death of his father he became president. On organization of the corporation in 1923 he was made chairman. Mr. Jones is survived by his widow, a son and a daughter.

See No German Lockout

Washington, Jan. 3.—A cable to the department of commerce from Berlin states that a steelworks lockout is not expected as a consequence of arbitration of labor demands for the 8-hour day.

Rail Mill Rate Goes Up

Chicago, Jan. 3.—Rail mill operations increase steadily. The steel ingot rate for the district is near 75 per cent.

Manganese Sales Small

New York, Jan. 3.—Hand-to-mouth methods are reflected in manganese ore buying for 1928. Instead of contracting for the full year, buying in most cases has involved shipments over first four months. The ore most-

ly involved is Caucasian. The washed grade of Caucasian ore, running 53 to 55 per cent, may be quoted 38 to 40 cents per unit, c.i.f. tidewater.

Revises Depletion for Metal Mines

Washington, Jan. 3.—Senator King of Utah, has introduced an amendment in the senate to the revenue bill, which has been referred to the committee on finance in connection with metal mines. The amendment follows:

"This paragraph shall not apply to metal mines discovered after the effective date of this act.

"(2) In the case of metal mines the allowance for depletion shall be 15 per cent of the gross income from the property during the taxable year. Such allowance shall not exceed 50 per cent of the net income of the taxpayer (computed without allowance for depletion) from the property, except that in no case shall the depletion allowance be less than it would be if computed without reference to this paragraph.

Buys Tunnel Material

New York, Jan. 3.—Mason & Hanger, contractors, have divided 54,000 tons of cast segments for the Fulton street tunnel equally between Bethlehem Steel Co. and Davies & Thomas. They also have placed 9000 tons of shapes with American Bridge Co.

Blows in Stack at Gary

Chicago, Jan. 3.—The Illinois Steel Co. was blowing in a blast furnace stack at its Gary works today, making seven active at Gary, six at South Chicago and one at Joliet.

Completing Corp. Stacks

Birmingham, Ala., Jan. 3.—One of the new Tennessee Coal, Iron & Railroad Co. blast furnaces will be ready in February and the second in April.

Pig Iron Output Lowest Since 1924

FOR the eighth consecutive month production of coke pig iron in the United States declined, according to an estimate compiled by IRON TRADE REVIEW from reports telegraphed by blast furnaces. With output figures now available for the whole year, 1927 shows a total which is the lowest since 1924. Early in December it appeared that production might swing upward before the close of the year, but the improvement failed to appear and on Dec. 31, operating stacks totaled one less than on Nov. 30.

Total pig iron made in December was 2,679,663 gross tons, which compared with the 2,661,863 tons of November, was a gain of 17,800 tons. December, however, had 31 days, against 30 in November. Average daily production was 86,441 tons, or a loss of 2287 tons from the 88,728-ton daily rate of the month before. This drop represented 2.8 per cent. The December rate was the lowest for any month since July, 1925, and the lowest for any December since 1921 when the rate was 52,992 tons per day.

Compared with December of last year production was 13,210 tons or 13.3 per cent less. Total production for 1927 was 36,270,567 gross tons, compared with 39,100,941 tons in 1926. Average daily production was 99,371 tons, while for 1926 it was 107,126 tons.

On the last day of the month, 170 of the country's 354 serviceable blast furnaces were in operation. This represented an activity of 48 per cent. On Nov. 30, active stacks totaled 171, or 47.7 per cent of the 359 total. Of the nonmerchant class none was blown in and 2 were blown out or banked; of the nonmerchant or steelworks class, 3 were blown in and 2 blown out.

With the dismantling or abandonment of 5 additional blast furnaces, the total of 359 on Nov. 30 has been reduced to 354 on Dec. 31. The furnaces removed were: Hokendauqua No. 1 of Thomas Iron Co. at Hokendauqua, Pa.; Swede No. 1 of Alan Wood Iron & Steel Co. at Swedeland, Pa.; Haselton No. 1 of the Republic Iron & Steel Co. at Youngstown, O.; Standard of Tennessee Products Corp. at Goodrich, Tenn.; and Buena Vista of Alleghany Ore & Iron Co. at Buena Vista, Va.

Stacks blown in during December were: In Ohio: Lorain No. 4, National Tube Co. In Pennsylvania: Cambria F, Bethlehem Steel Co.

Stacks blown out during the month were: In Ohio: One River, Corrigan-McKinney Steel Co. In Pennsylvania: Perry, Perry Iron Co. In New York: Lackawanna C, Bethlehem Steel Co.; one Donner, Donner Steel Co. In Colorado: One Minnequa, Colorado Fuel & Iron Co.

MONTHLY PRODUCTION

	1927	1926	1925
January	3,101,346	3,319,789	3,372,207
February	2,940,604	2,923,850	3,214,067
March	3,482,107	3,458,171	3,571,422
April	3,424,377	3,438,805	3,211,235
May	3,391,067	3,477,820	2,933,907
June	3,089,726	3,232,478	2,679,045
July	2,954,625	3,224,663	2,665,262
August	2,950,674	3,200,723	2,707,171
September	2,782,500	3,163,269	2,725,885
October	2,812,015	3,334,206	3,017,889
November	2,661,863	3,237,992	3,023,257
December	2,679,663	3,089,175	3,249,057
Grand total	36,270,567	39,100,941	36,370,404

Active Blast Furnaces

	In blast	Total	Per Cent
December	170	354	48.0
November	171	359	47.7
October	174	361	48.2
September	181	362	50.0
August	189	362	52.2
July	190	362	52.5
June	198	362	54.7
May	211	363	58.1
April	221	364	60.7

DECEMBER PIG IRON

	No. of stacks	Number in blast last day of month Dec.	Nov.	—Totals— Dec.	Nov.
Ohio	69	37	37	620,187	632,061
Pennsylvania	118	53	53	811,352	800,033
Alabama	34	18	18	202,200	219,478
Virginia	14	1	1	7,323	7,357
New York	25	13	15	184,914	196,123
New Jersey	3	0	0	.....	.....
Illinois	26	16	16	301,579	282,900
Colorado	5	3	2		
Indiana	18	11	11	354,545	338,475
Maryland	6	5	5		
Wisconsin	5	1	1		
Kentucky	5	1	1		
Massachusetts	1	1	1		
Tennessee	10	1	1	89,086	86,494
Utah	1	1	1		
West Virginia	5	2	2		
Michigan	4	4	4		
Minnesota	3	2	2	81,068	74,570
Missouri	1	0	0		
Texas	1	0	0		
Spiegel and ferro—all states	....	....	....	27,409	24,372
Total	354	170	171	2,679,663	2,661,863

AVERAGE DAILY PRODUCTION

	1927	1926	1925	1924	1923
Jan.	100,043	107,089	108,781	97,273	104,136
Feb.	105,021	104,423	114,788	105,987	106,925
Mar.	112,326	111,554	115,207	111,787	113,664
Apr.	114,146	114,627	107,041	107,537	118,210
May	109,388	112,187	94,642	84,515	124,790
June	102,991	107,749	89,301	67,427	122,262
July	95,311	104,021	85,976	57,531	118,860
Aug.	95,183	103,249	87,328	60,741	111,254
Sept.	92,750	105,442	90,862	68,454	103,917
Oct.	90,710	107,555	97,351	79,419	101,376
Nov.	88,728	107,933	100,775	83,832	96,378
Dec.	86,441	99,651	104,808	95,367	93,952
Ave.	99,371	107,126	99,645	84,908	109,659

Sheet Mills Merge

Six Independents Are Joining as Empire Steel Corp.

Empire Steel Corp. has been incorporated in Ohio as the successor to the Mansfield Sheet & Tin Plate Co., Mansfield, O.; Ashtabula Steel Sheet Co., Ashtabula, O.; Waddell Steel Co., Falcon Steel Co. and Thomas Sheet Steel Co., Niles, O.; and Empire Steel Co., Cleveland. W. H. Davey, president of the Mansfield and Ashtabula companies, is president and chief executive of the new corporation.

The merger brings together $20,000,000 in assets, a finished roll steel capacity of 400,000 tons annually, 60 sheet mills, four 100-ton open-hearth furnaces and a sheet bar mill. Negotiations were conducted by Floyd A. Deahl & Associates, Cleveland.

The new corporation has 150,000 shares of $100 par preferred and 550,000 shares of no par common. Notices have been mailed to stockholders. Incorporators other than Mr. Davey are J. D. Waddell, president of the Waddell Steel Co., Niles, O.; A. W. Wheatley, president, treasurer, Empire Steel Co.; William A. Thomas part-owner, Thomas Sheet Steel Co.; Lloyd Booth, president-treasurer, Falcon Steel Co.; and M. C. Robinson, director, Ashtabula Steel Sheet Co.

Sheet, Tin Plate and Bar Iron Wages Lower

Bar iron mill wages will be reduced slightly in January and February, based on an average sales price of 1.85c for bar iron in November and December, 1927. Puddlers will receive $11.05 a ton, or 25 cents less than in the past two months. In November and December they were reduced 25 cents from $11.55 in September and October. Wages of roll hands will be reduced about 2 per cent in January and February. These changes apply in mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers. Following is a comparison of reported sales price averages:

	1927	1926	1925	1924	1923
Jan. Feb.	1.95c	2.00c	2.00c	2.35c	2.25c
Mar.-Apr.	1.95c	2.05c	2.35c	2.35c	1.50c
May-June	1.95c	2.00c	2.05c	2.25c	2.50c
July-Aug.	1.95c	2.00c	1.95c	2.15c	2.50c
Sept.-Oct.	1.90c	2.00c	1.95c	2.10c	3.40c
Nov.-Dec.	1.85c	2.00c	1.95c	2.05c	2.35c
Yearly av.	1.90c	2.00c	1.99c	2.21c	2.30c

Amalgamated sheet and tin plate mill wages for January and February will be 25½ per cent above base, against 28½ per cent above base in November and December. The bimonthly examination disclosed an average sales price of sheets, on which the wages are based, of 3.00c in November and December, compared with 3.10c in the two months preceding. Following is a comparison of the reported price averages:

Nov.-Dec.	3.00c	—3 per cent
Sept-Oct.	3.10c	+3 per cent
July-Aug.	3.00c	unchanged
May-June	3.00c	unchanged
March-April, 1927	3.00c	—3 per cent
Jan.-Feb.	3.10c	—4½ per cent
Nov.-Dec.	3.25c	unchanged
Sept.-Oct.	3.25c	unchanged
July-Aug.	3.25c	unchanged
May-June	3.25c	unchanged
March-April	3.25c	+1½ per cent
Jan.-Feb., 1926	3.20c	+3 per cent

Men of Industry

JOHN S. KEEFE, senior vice president and associated with the American Steel & Wire Co. since it was formed in 1899, has been elected president, succeeding William P. Palmer, who died Dec. 17.

Henry A. Barren, general superintendent of the Steel & Wire company, has been elected vice president in charge of operations, and Frank Baackes, a vice president, has been promoted to senior vice president.

* * *

John Van Horne, representative of the Lincoln Electric Co., Cleveland, in Atlanta, Ga., has been transferred to Moline, Ill.

* * *

W. M. Flook, chairman of the American Brown Boveri Electric Corp., New York, has also been elected president of that company.

* * *

J. E. Lewis, president of Harbison-Walker Refractories Co., Pittsburgh, has been elected a director of the American Arch Co., New York.

* * *

M. J. Schmitt, formerly in charge of the Milwaukee branch office of Kearney & Trecker Corp., Milwaukee, builder of milling machines, has been made assistant sales manager.

* * *

Harvey Hubbell Jr. has been elected president and treasurer of Harvey Hubbell Inc., Bridgeport, Conn., manufacturer of electrical supplies, succeeding Harvey Hubbell Sr., whose death was announced in IRON TRADE REVIEW, issue of Dec. 29.

* * *

Clinton M. Finney, formerly controller and vice president of the Worthington Pump & Machinery Corp., New York, has been made controller of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Warren H. Jones, assistant secretary of the Westinghouse company since 1911, has been made secretary, and Edward J. Mulligan has succeeded him as assistant secretary.

* * *

Charles D. Dyer, member of W. P. Snyder & Co. and affiliated with the Snyder interests for 24 years, resigned, effective Dec. 31. He retires from active participation in the management of the various companies, resigning as vice president of the Shenango Furnace Co. and secretary of the Shenango Steamship Co. For the time being he will remain identified in an advisory capacity.

Obituary

JOHN HARKIN COYLE, 74, for 40 years superintendent of Levering & Garrigues Co. Inc., Dunellen, N. J., structural fabricator, prior to his retirement five years ago, died Dec. 28 at his home in Plainfield, N. J.

* * *

James R. Kilbourne, 57, former president of the Kilbourne & Jacobs Mfg. Co., Columbus, O., died in New York, Dec. 22.

* * *

Donald Pershing Carter, New York district manager for W. W. Sly Mfg. Co., Cleveland, foundry equipment manufacturer, died recently.

* * *

Dennis J. Crowley, 67, general superintendent of the Meadville Malleable Iron Co., Meadville, Pa., died recently at his home in Rochester, N. Y.

* * *

J. Howard McFeeley, 50, vice president in charge of sales of the McFeely Brick Co., Latrobe, Pa., died at his home in Pittsburgh, Dec. 26.

* * *

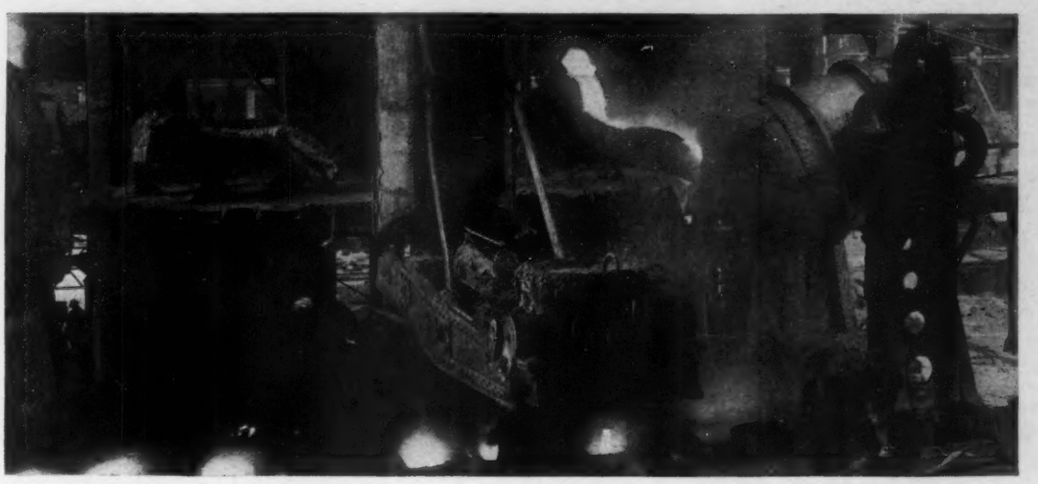
Gustave Haarmann, 67, president of G. Haarmann & Co. Inc., Holyoke, Mass., structural iron and steel worker, died Dec. 17. He incorporated his company in 1913.

* * *

Albert H. Roberts, a former superintendent of the Eastern Rolling Mill, Cleveland, died Dec. 26, at his home there, aged 62. He entered the employ of the Newburg Rolling Mills when he was 16, spending 40 years in the industry before retiring in 1921.

* * *

Charles Henry Zehnder, 71, for many years a prominent figure in the eastern iron industry, died Dec. 26 in New York, his home. At the time of his death, Mr. Zehnder was vice president of the Scranton Bolt & Nut Co., Scranton, Pa., a director of the Warren Foundry & Pipe Co., and a director of companies affiliated with the pipe company.



Domestic Market Reviews for 1927

Pig Iron
Coke
Semifinished Steel
Tin Plate
Cast Iron Pipe
Merchant Bars
Welded Pipe
Wire Products
Warehouse
Ferroalloys
Structural Shapes
Rails
Sheets
Plates
Nonferrous Metals
Old Material
Coal By-Products
Strip
Refractories

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H. R. Simonds, Boston

Year Shows Moderate Recession From 1926

In Production

	*1927	1926
Coke Pig Iron	36,350,904	39,100,941
Steel Ingots	43,034,000	46,936,205
Coke	51,150,000	56,865,537
Structural Bookings	2,760,000	2,553,540
Autos and Trucks (U. S.)	3,480,000	4,219,449
Freight Cars (ordered)	51,150	60,575

*December estimated.

Pig iron and steel ingots in gross tons; coke and structural bookings in net tons.

In Prices

Average prices on typical grades in representative markets

	1927	1926
10 Pig Iron	$19.23	$21.19
4 Semifinished	36.22	37.82
11 Heavy Finished	1.84	2.10
6 Sheet	3.05	3.20
6 Scrap	14.76	15.79

Heavy finished and sheet prices are cents per pounds; others dollars per ton.

1927 Output Is Good but Buyers Rule and Markets Falter

By E. C. Barringer

A YEAR of arresting contrasts in iron and steel. Of production above the average but competition for business most drastic. Of prices weak and wavering out of proportion to the aggregate of demand. Of service and terms to buyers not compatible with their scattered, diluted purchasing. Of profits to producers indefensible considering volume. Such, in a market way, was 1927.

With December estimated, the year's output of pig iron was 36,350,904 tons and of steel ingots 43,034,000 tons. Compared with 1926 this was a reduction of about 7 per cent in both. Set against the average of postwar production, the year rates 113 per cent. A satisfying volume of basic production, indeed, but again in contrast to the predominant cheerless sentiment.

Irregularity characterized prices, in variance with tranquil 1926. In the lighter steel products, especially sheets and strip, fluctuations were most pronounced and efforts to restore stability numerous but abortive. Heavy finished steel suffered a collapse in the third quarter, to recover partially in the fourth. In pig iron as in steel the price structure was weak and tending downward most of the year.

Buyers Hold Whip Hand

It was decidedly a buyers' year. An excess of finishing capacity hung over the market and bred competition for orders that was not consistent with the underlying volume of basic production. Buyers pitted producers against one another, and not infrequently benefitted from the internecine competition of the mills. They upset most efforts to restore or advance quantity differentials. They were enabled to hold inventories down and order only when actual requirements compelled. Buyers frequently exacted the same prices and terms on mixed carloads as on 1000-ton lots.

Year Breaks Two Ways

Considering steel production, 1927 presented two distinct phases—the first quarter and the last three quarters. The first quarter wrote finis to the bulge which got under way late in 1924, gathered momentum in 1925, surged forward in 1926 and shot up to an all-time high in March, 1927. The reaction to this tremendous effort was immediate and complete. In seven months, or by November, the daily ingot rate had surrendered the gains it had made in the upswing of 20 months. Pig iron was sympathetically prostrated in the last three quarters. But the promise of 1928 was bright as the year ended and convalescence may be speeded in the first quarter.

Despite its caprice, 1927 was in many ways the most normal of the postwar years. Sales forces turned doorknobs in prewar manner. There was more talk of a sales consciousness, of better merchandising methods, of collective educational effort, of research to develop new outlets. The year's pains may yet prove salutary.

High Lights Numerous

An analysis of major consuming outlets for iron and steel reveals many high lights which are the more conspicuous because of the shadowy cast of much of the market year. Building was surprisingly large considering the malpractice of pessimistic forecasts. Automotive production, while 18 per cent under the record of 1926, must

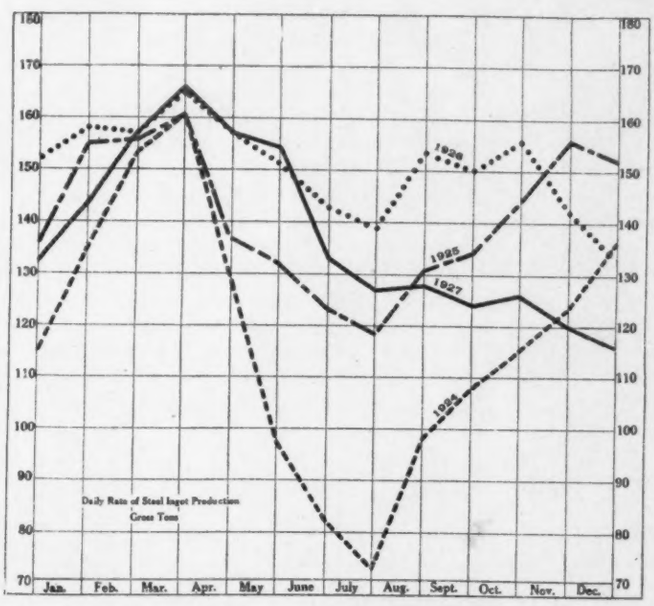
be appraised in the light that Ford not only was completely out of production over six months but also retarded sales generally. Oil county demand for pipe reached such proportions in November as to make it the heaviest order month in history. The railroads were disinclined to buy cars but took a normal quantity of track material.

It would have been extraordinary if a year so colorful in sales effort and price fluctuations as 1927 had not dug new channels of trade. Particularly was this true of transportation by water. Pig iron moved in increasing volume by boat from Cleveland and Buffalo to Chicago and Milwaukee. Detroit drew by water steel from Chicago, Cleveland and Buffalo and sent semi-finished steel and scrap to Lake Erie ports. Steamers carrying scrap from Duluth to Buffalo had return cargoes of rails and other products. Much pig iron was barged in the East, and not a little was delivered by truck in New England.

Create New Steel Bases

The trend toward localization of steel markets was pronounced. Eastern mills did not always regard Pittsburgh base as a fetish when conceding a portion of the freight netted them business. In December a large independent maker announced heavy finished steel prices based at its eastern plants. A Cleveland base on bars and strip figured more prominently in sales in Michigan.

Invasion of domestic markets by alien producers kept Washington on the qui vive more than in any preceding year, although import statistics disclose less cause for alarm. The federal tariff commission investigated conditions in manganese ore, magnesite and fluorspar, while the treasury department busied itself with countervailing and antidumping provisions of the tariff act in regard to iron and steel products from Germany and pig iron from British India. French makers of cast iron pipe at will underbid domestic makers several dollars a ton. European bars, plates and shapes continued to disturb, especially the warehouse trade, on the Atlantic and Gulf coasts. Imports of iron and steel, at approximately 725,000 tons, were one-third less than in 1926, and the smallest since 1924. Exports, however, approximated the 2,170,000 tons of 1926.



Steel ingot production soared to an all-time high last March, but unlike the three preceding years, did not come back in August. Will 1928 *make good this deficiency in the country's supply of steel? Most forecasters think that it will.*

The incidence of extraneous occurrences upon the iron and steel markets was negligible. There were no wars of consequence to affect domestic or foreign commerce. The easy interest rates and the generally upward movement of the stock markets were mildly helpful. Neither price nor production history for 1927 records that union bituminous coal miners struck April 1. Congress initiated no legislation particularly inimical to business and did not tinker with the tariff. The President's decision to retire in 1929 emphasized the immunity of business to all but the most drastic of overturns in domestic politics. The sequel to the passing of Judge E. H. Gary was the elevation of Charles M. Schwab to the presidency of the American Iron and Steel institute and public affirmations of a desire for cooperation and price stability by independent and Corporation officials alike.

Continuous Mills Gain

Refinement of the continuous process for rolling strip, sheets and tin plate was the chief engineering contribution of the year. Partially on account of the lowered production costs, lines of competition were drawn tighter and merger talk persisted. American Rolling Mill Co. took over Columbia Steel Co. while Republic Iron & Steel Co. acquired Trumbull Steel Co. The Superior Sheet Steel Co., Kokomo Steel & Wire Co. and Chapman-Price Steel Co. combined as the Continental Steel Corp. Mahoning Valley sheet mills tried to merge.

Nineteen twenty-eight is, of course anybody's guess. Those seers with the most unblemished pasts are, however, unanimously bullish and have tinctured their forecasts with few weasel words. They see auto production attaining a new peak, the railroads replenishing their rolling stock, the oil industry buying more tanks and pipe than in 1927, and building maintained at a high level. Certainly 1928 comes in on the wings of cheerful sentiment which is more substantial than hope.

Domestic Iron and Steel Prices in 1927

Average Monthly Prices of Leading Materials at Pittsburgh

PIG IRON

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bessemer	$21.26	$20.76	$21.16	$21.26	$20.86	$20.66	$20.26	$20.26	$19.86	$19.76	$19.76	$19.26
Basic (valley)	18.50	17.85	18.50	19.00	18.10	17.90	17.50	17.50	17.15	17.00	17.00	17.00
Foundry No. 2	20.21	19.81	20.16	20.26	20.26	19.96	19.26	19.26	19.26	19.26	19.26	19.01
Malleable	20.26	19.86	20.16	20.26	20.26	20.01	19.26	19.26	19.26	19.26	19.26	19.01
Gray Forge	19.71	19.31	19.66	19.76	19.76	19.51	18.76	18.76	18.76	18.76	18.76	18.51
Bessemer Ferrosilicon 10 per cent	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	33.50	32.00	30.00

SEMIFINISHED

Billets, Bessemer	$35.00	$34.00	$33.60	$33.50	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00
Billets, Open Hearth	35.00	34.00	33.60	33.50	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00
Sheet Bars, Bessemer	36.00	35.00	34.00	33.75	33.75	33.50	33.50	33.50	33.90	34.00	34.00	34.00
Sheet Bars, Open Hearth	36.00	35.00	34.00	33.75	33.75	33.50	33.50	33.50	33.90	34.00	34.00	34.00
Wire Rods	45.00	43.50	43.00	42.50	42.00	42.00	43.00	43.00	43.00	42.50	41.00	40.00

COKE

Furnace, Spot	$3.35	$3.35	$3.30	$3.20	$2.80	$2.85	$2.90	$3.00	$2.85	$2.85	$2.80	$2.65
Foundry, Spot	4.25	3.85	4.15	4.05	3.80	3.90	4.00	4.00	4.00	3.75	3.75	3.65

ROLLED PRODUCTS

Structural Shapes	1.95c	1.90c	1.90c	1.90c	1.85c	1.80c	1.80c	1.80c	1.80c	1.75c	1.75c	1.80c
Plates, base	1.90	1.85	1.90	1.85	1.85	1.80	1.80	1.80	1.80	1.75	1.75	1.80
Steel Bars, base	1.95	1.90	1.90	1.90	1.85	1.85	1.80	1.80	1.80	1.75	1.75	1.80
Cold Finished Steel Bars	2.35	2.35	2.40	2.40	2.40	2.35	2.30	2.30	2.20	2.15	2.10	2.10
Strip, Hot Rolled, base	2.20	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.00	1.90
Strip, Cold Rolled, base	3.10	2.90	2.95	3.00	3.00	3.25	3.25	3.25	3.15	2.95	2.95	3.00
Steel Pipe, 1 to 3-inch disct	.62	.62	.62	.62	.62	.62	.62	.62	.62	.62	.62	.62
Standard Spikes, base	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Wire Nails, base	2.65	2.60	2.55	2.55	2.55	2.50	2.55	2.55	2.55	2.55	2.50	2.50
Plain Wire, base	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Hoops, base	2.40	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.20	2.15
Bands, base	2.40	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.20	2.15
Structural Rivets, base	2.35	2.30	2.30	2.75	2.75	2.75	2.75	2.85	2.85	2.75	2.75	2.75
No. 24 Black Sheets	2.95	2.90	2.90	2.80	2.90	3.00	3.00	3.00	3.00	2.95	2.80	2.75
No. 10 Blue Annealed Sheets	2.25	2.20	2.20	2.20	2.25	2.25	2.25	2.25	2.25	2.15	2.10	2.10
No. 24 Galvanized Sheets	3.80	3.70	3.70	3.65	3.80	3.80	3.85	3.85	3.85	3.80	3.70	3.60
Tin Plate, base box	5.50	5.50	5.50	5.50	5.50	5.45	5.50	5.50	5.50	5.30	5.30	5.25

OLD MATERIAL

Heavy Melting Steel	$17.00	$16.10	$16.40	$16.50	$15.50	$15.10	$14.95	$15.00	$15.00	$14.50	$14.20	$14.60
Low Phosphorus	20.25	19.50	20.00	20.50	19.10	19.10	19.00	19.00	20.00	19.50	18.60	18.50
No. 1 Cast	16.00	15.60	15.60	16.00	15.75	15.10	15.00	15.00	15.00	14.70	14.50	14.50

Average Monthly Prices of Leading Materials at Chicago

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lake Superior Charcoal	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04
Northern No. 2 Foundry	20.90	20.25	20.00	20.00	20.00	20.00	20.00	19.50	19.50	18.75	18.50	18.50
Southern No. 2 Foundry	24.51	24.01	24.01	24.01	24.01	24.01	23.45	23.26	23.26	23.26	23.26	22.01
Malleable	20.90	20.25	20.00	20.00	20.00	20.00	20.00	19.50	19.50	18.75	18.50	18.50
Bar Iron	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	1.90c	1.85c	1.90c
Rail Steel bars	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.80	1.80	1.80
Soft Steel bars	2.10	2.00	2.00	2.00	2.00	2.00	2.00	1.95	1.85	1.85	1.85	1.90
Structural Shapes	2.10	2.00	2.00	2.00	2.00	2.00	2.00	1.95	1.85	1.85	1.85	1.90
Plates	2.10	2.00	2.00	2.00	2.00	2.00	2.00	1.95	1.85	1.85	1.85	1.90
No. 24 Black Sheets	3.15	3.00	3.00	3.00	3.10	3.15	3.15	3.15	3.15	3.10	3.00	3.00
Heavy melting steel	$13.20	$13.10	$13.05	$13.10	$12.35	$12.00	$12.10	$12.35	$12.20	$11.75	$11.50	$11.95
No. 1 railroad wrought	14.20	13.95	13.50	13.50	12.75	12.10	12.35	13.45	12.70	11.40	11.25	11.25
Rails for rolling	16.00	16.00	15.50	15.85	15.10	14.60	14.60	15.00	15.20	14.70	13.95	14.00
Car wheels, iron	14.95	15.10	15.00	14.85	14.00	13.50	13.80	14.75	14.25	13.50	13.15	13.40
No. 1 Cast (mchy)	18.90	18.90	18.50	18.10	17.35	16.65	16.55	16.80	16.80	16.25	15.85	15.70

Average Monthly Prices of Leading Materials in the East

PIG IRON

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Basic, Eastern Pennsylvania	$21.25	$21.00	$21.00	$20.90	$20.75	$20.75	$20.50	$19.75	$19.75	$19.50	$19.50	$19.25
No. 2X Foundry, Philadelphia	22.76	22.26	22.26	22.26	22.26	22.01	21.51	21.26	21.01	20.66	20.51	20.26
No. 2X Virginia, furnace	21.75	22.00	22.00	22.00	22.00	22.00	22.00	21.50	21.50	21.50	21.25	21.00
Standard Low Phosphorus, Phila	25.76	25.76	25.76	25.76	25.76	25.76	25.76	25.26	25.26	25.26	24.76	24.76
Standard Gray Forge, Eastern Pa	21.25	21.00	21.00	21.00	20.75	20.75	20.50	20.50	20.51	20.01	20.01	20.01

ROLLED PRODUCTS

Tank Plates, base, Philadelphia	2.22c	2.22c	2.22c	2.22c	2.17c	2.17c	2.12c	2.12c	2.07c	2.07c	2.07c	2.05c
Structural Shapes, base, Phila	2.22	2.12	2.12	2.12	2.07	2.07	2.07	2.02	2.02	2.07	2.07	2.03
Steel Bars, Base, Philadelphia	2.27	2.22	2.22	2.22	2.17	2.17	2.12	2.12	2.07	2.07	2.07	2.12
Bar Iron, common base, Phila	2.22	2.22	2.17	2.17	2.17	2.17	2.17	2.12	2.07	2.07	2.07	2.07
No. 10 Blue Annealed Sheets, Phila	2.57	2.52	2.52	2.52	2.57	2.57	2.57	2.57	2.52	2.47	2.42	2.42
Billets, Open Hearth, Philadelphia	$40.30	$39.30	$39.30	$39.80	$39.80	$39.30	$38.80	$38.80	$38.80	$38.80	$38.80	$38.30

OLD MATERIAL

†No. 1 Heavy Melting Steel	$15.60	$15.00	$14.75	$14.75	$14.45	$14.25	$13.75	$13.75	$14.00	$14.00	$14.00	$14.00
†No. 1 Railroad Wrought	17.00	17.00	17.65	16.75	16.75	16.75	16.25	15.95	15.75	15.75	15.75	15.75
†No. 1 Cupola Cast	17.75	17.50	17.50	17.25	17.25	16.75	16.35	16.25	16.25	16.25	16.75	16.75

†These prices apply to delivery at Eastern Pennsylvania consuming points other than Bethlehem.

Pig Iron Distribution in Flux

Way of Merchant Stacks in Valley Is Hard—Boat Iron Affects Chicago Market—East Is Shipping More by Water—General Trend in 1927 in Both Price and Production Was Down—Price Cuts in South Sharp

HAZARDS attending merchant pig iron production were probably more pronounced in the Mahoning valley section than any other area in 1927. These hazards include increased spot buying, with attendant high handling costs; liquidation of stocks at the Josephine, Clinton and Struthers stacks at prices below market levels; and continued participation of steelworks furnaces in the open market on all grades of iron, many times conducted to utter exclusion of the merchant stack because of reciprocal buying arrangements. This reciprocity method of conducting business was employed throughout 1927. The purchase order for pig iron would go to the steelmaker who last bought the product of that particular pig iron buyer, although another steelmaker might have much more of that particular buyer's equipment in his plant.

MONTHLY PIG IRON AVERAGES

	1927		1926	
	Bess.	Basic	Bess.	Basic
Jan.	$19.283	$18.25	$21.00	$20.00
Feb.	19.00	18.00	21.00	20.00
March	10.39	18.57	21.00	20.00
April	19.50	18.73	19.617	18.90
May	19.18	18.20	19.359	18.00
June	18.895	17.857	19.00	18.00
July	18.50	17.50	18.679	17.50
Aug.	18.31	17.25	18.11	17.417
Sept.	18.00	17.083	18.35	17.50
Oct.	18.00	17.00	19.00	18.00
Nov.	17.875	17.00	19.944	18.50
Dec.	.....	.....	19.50	18.50

In 1927, however, it was plainly demonstrated that the steel company cannot always justifiably be made to bear the blame of cutting prices to get business which ordinarily would go to merchant furnaces. In several instances, particularly in the case of a large sanitary ware interest, the merchant furnaceman took the initiative in creating the low figures. This was done either to collect a tonnage backlog or to dispose of large stocks of foundry iron.

Merchant furnaces are fast losing out in the sale of steelmaking iron, particularly basic. In recent years they always had been given a chance to quote on tonnage, even if this was only a matter of form to check up the steelworks furnace price. In 1927 in numerous inquiries in the Pittsburgh district, large tonnages of basic and bessemer often were closed by the steelworks before the merchant furnaces knew of the inquiry. In recent years the position of the steel companies in this regard has completely reversed. Prior to 1918 almost all were buyers of basic iron, including three important interests which now are fully integrated. Now, none buy and with the exception of the three referred to, all sell when opportunity presents itself.

The Year's Range

	High	Low
No. 2 foundry, valley	$19.00	$17.25
Basic, valley	19.00	17.00
No. 2 foundry, Chicago	21.50	18.50

As a contrast to 1926, when the summer developed much automotive and allied business, the summer of 1927 was almost devoid of this character of buying, due to the automobile slump which began in March-April. Pig iron consumers stocked heavily in the first quarter against coal strike contingencies they thought would develop April 1. These did not appear and absorption of those stocks was spread over a longer period and militated against open market iron buying well into fourth quarter.

The buyers' general rule was, however, to avoid stocks. Excellent railroad transportation aided in carrying low inventories. Sanitary ware, radiator, cast iron pipe and various other lines, however, took larger tonnages, usually by quarters. Late in November a large sanitary ware manufacturer decided the market was sufficiently low at $17.25, valley, for No. 2 plain foundry that he covered on first half 1928 requirements, dividing the order among two merchant furnace interests, two steelworks furnaces, and a middle interest.

The general trend of prices on bessemer and basic iron can be ascertained from the accompanying comparison of average sales prices compiled by W. P. Snyder & Co.

Notwithstanding paucity of demand in the middle six months, when some foundries were operated on a 20 to 40 per cent basis, merchant production of pig iron fell off only about 100,000 tons from the high point in March to the low point in September; as revealed by the accompanying compilation by IRON TRADE REVIEW.

Water and truck transportation have been increasingly important factors in pig iron competition along eastern tidewater. Buffalo furnaces shipped considerable iron by the New York state barge canal to points in New York harbor and along Long Lsland sound. The Port Henry and Troy furnaces also shipped by barge to similarly located points and to inland points in New Jersey and eastern Pennsylvania. The Mystic furnace shipped by water to points along the New England coast, to New York harbor and Philadelphia district. Mystic shipped at least 50,000 tons by barge to docks of pipe plants at Florence and Burlington, N. J. The Troy furnace also sold considerable tonnage to Delaware river pipe plants. The furnace at Chester also made use of its location on the Delaware river to ship by barge. Mystic, in addition to shipping by water, trucked to nearby consumers.

COKE PIG IRON PRODUCTION

	Furnaces in blast last day of month	Merchant output	Non-merchant output	Total output
Jan.	210	745,766	2,355,580	3,101,346
Feb.	218	642,804	2,297,800	2,940,604
March	223	762,354	2,719,753	3,482,107
April	221	735,385	2,688,992	3,424,377
May	211	701,582	2,689,485	3,391,067
June	198	714,268	2,375,458	3,089,726
July	190	736,707	2,217,918	2,954,625
Aug.	189	667,104	2,283,570	2,950,674
Sept.	181	651,246	2,131,254	2,782,500
Oct.	174	688,880	2,123,135	2,812,015
Nov.	171	652,237	2,009,626	2,661,863
Dec.	.....	*676,000	*2,084,000	*2,760,000
1927 Total		8,374,333	27,976,571	36,350,904
1926 Total		8,683,509	30,417,432	39,100,941

*Estimated.

Only one furnace, Pulaski, now is active in Virginia. This furnace has produced more iron than the Virginia market has been able to absorb and there appears no likelihood of expanded production in Virginia.

Chicago merchant furnaces found prices stable, in comparison with eastern districts. Four price declines were made. On the whole, the year ended with better business than had

been expected. Shipments were about 80 per cent of 1926.

About 30,000 to 35,000 tons of foundry and malleable iron was shipped into Chicago and Milwaukee by lake from Cleveland and Buffalo furnaces, this movement being the heaviest in years. Most of this iron was offered at 50 cents under the Chicago furnace base price, but with differentials waived some sales undercut $1. The tonnage by boat was relatively small as regards total consumption in the Chicago-Milwaukee district, but had a weakening effect on the Chicago market.

Southern iron experienced drastic price reductions. No. 2 foundry at Birmingham dropped from $20 to $18 as 1927 opened, went to $17.25 in July and to $16 in November, the latter price enabling southern iron to go to Ohio river crossings on a parity with lake iron.

By-Product Coke Strengthens Industrial Hold

DEVELOPMENTS in the Connellsville beehive coke market in 1927 included stronger competition from by-product coke makers; maintenance of wage scales, after the reduction of 20 per cent late in January, at a level which justifiably could have been lowered had actual coke selling prices dictated the policy; alternate banking and blowing of blast furnaces in times of low pig iron demand which created excess supplies of coke which were sold at low figures. The bituminous coal strike of April 1 proved abortive in its effect upon the Connellsville region. Some buyers who had collected large stocks of furnace and foundry coke against this emergency used them slowly in second and third quarters because of low operating rates.

The year started with many blast furnaces under contract at $4 to $4.50 for furnace coke. Following the wage reduction of January, these were readjusted to below $4. Some spot prices of $3.25 then prevailed. As demand mounted, nearer the coal strike date, the spot market strengthened and sales were noted at $3.50 and higher. At the end of March contract figures of $3.50 to $4 were quoted for second quarter, some being booked at $3.75. Makers gradually reduced output to contract obligations. By May, spot prices of $2.75 and $2.85 were more common and occasionally $2.65 appeared.

The Year's Range

	High	Low
Furnace, Connellsville	$4.75	$2.50
Foundry, Connellsvile	5.50	3.50

Prices above $3 were quoted for third quarter and some contracts with provisional wage clauses were written for last half or third quarter at $3.15. Initial shipments on some last half contracts were of such poor quality they were refused and one contract was later cancelled, the buyer for a time depending upon the spot market. This extra demand strengthened the situation somewhat, and $3 to $3.15 was paid for spot shipments. Latterly a contract for fourth quarter carried $2.85 and one or two for the last quarter of 1927 and the first quarter of 1928 were written at $3.15.

The last half was particularly precarious in oven operating and profit making. By-product coke became increasingly important. One or two furnaces closed contracts at $2.50, Connellsville equivalent. Numerous gas producers educated to beehive coke went back to by-product because of lower prices. The alternate banking and blowing of blast furnaces presented a further weakening factor and soon the price on standard furnace grade not only approached but actually crossed the price of heating coke. By November and December some spot sales of standard furnace coke were made at $2.50 to $2.65, whereas that had been the spread on heating coke in October.

Lowered operating rates among foundries after April lessened demand for foundry coke. Numerous foundries stored coke against the coal strike and thus were overstocked. Early in the year foundry coke was selling at $4.25 to $5, with premium brands at $5.50 to $6. During the curtailed operations of the third quarter some $4.75 quotations were cut to $4.50 without inspiring additional buying, and $4.75 was quickly reinstated. At that time, however, considerable business was lost because the $4.75 customers decided to buy their fuel where they could get $4 and $4.25 prices. By November $3.75 and $4 appeared more plentiful and in December $3.50 was made. Premium brands at the end of the year for first half of 1928 carried $5.35 and $5.60 although for a time in third quarter one sold at $5.10.

By-product coke shipments in the Chicago district showed remarkable uniformity, considering irregularities in gray iron foundry activity. The contract quotation continued from the first of the year to Nov. 1 at $9.75, ovens, and $10.25, delivered Chicago. On Nov. 1 the contract price was marked down 75 cents to $9, ovens, and $9.50, delivered. Earlier in the year, 25 to 50 cents a ton above the contract price was obtained for spot business.

Direct Buying of Semifinished Limits Market

QUARTERLY contract arrangements on semifinished steel were departed from in increasing measure in 1927 and the month-to-month plan of buying more widely substituted. This is in harmony with low inventories and the adaptation thereto of sellers' ability to supply tonnage quickly. Another trend even more decided last year was the disappearance of open inquiries. Many purchasers have formed connections with nearby sources of supply who have been serving them for years.

The Year's Range

	High	Low
Sheet bars	$36.00	$33.00
Rerolling billets	35.00	33.00
Wire rods	45.00	40.00
Skelp	1.90c	1.75c

In January, billets and slabs were $35, Pittsburgh or Youngstown; forging billets $40, sheet bars and small billets $36, wire rods $45, and skelp 1.90c. Following the early February decline at Cleveland on billets, slabs and sheet bars to $34, mill, Pittsburgh and Youngstown levels weakened as specifications shrank. By March $33 was common on billets, with $34 on sheet bars, and outstanding contracts were readjusted.

Semifinished purchases for June were larger than for May because of large carryovers from April. Supplies lasted longer because of re-

duced operating schedules. Only a slight measure of strength was imparted to the billet and sheet bar market due to some storing against coal strike emergencies. The differential for small billets, set aside for several weeks, was restored. Soon, however, sheet specifications dropped off and these were coaxed in at $33.50 with indifferent success. This later rebounded to $34, where it remained.

In spite of the decline in rerolling billets, forging billets held well throughout the first five months at $40. Some eastern competition then was recognized and $39 substituted. This in the fourth quarter was lowered to $38, and first-quarter 1928 contracts were taken at that figure.

Skelp remained at 1.90c for the first four months. In May 1.85c appeared and intermittent declines after that took it as low as 1.70c in some sections. In September 1.75c was introduced and in November advanced to 1.80c. The largest tonnage was bought by National Tube Co. from an affiliated interest for the 75,000 to 100,000-ton gas pipe line to Denver.

Wire rods declined $2, Feb. 7, to $43 and through last half were subjected to considerable fluctuation. They partially righted themselves by December at $42, after going to $40.

The Chicago district found a decrease in tonnage of semifinished material in the open market. Production was taken care of largely by consumptive demands of local users.

The eastern trade in semifinished steel is becoming attenuated. Consumers who in former years bought large tonnages of billets and slabs annually, are out of business or have become self-sustained. Eastern demand now appears satisfied with 10,000 to 15,000 tons of billets a year, mostly forging of special analyses.

Pipe Sales Small as Oil Line Building Lags

PAUCITY of oil line pipe business in 1927 was partially compensated by the intermittent buying of gas line pipe tonnages. These involved from a few hundred or few thousand tons at a time early in the year to the largest one on record, awarded the National Tube Co., in November, after having been talked about for 18 months or more. It called for 75,000 to 100,000 tons of 20 and 22-inch for a line from Amarillo, Tex., to Denver. This award greatly aided lapweld furnace operating schedules which had slumped considerably from early months, when backlogs enabled plants to average 85 to 90 per cent most of the first half. In the latter half operations often were as low as 50 per cent.

Oil lines occasionally were let, including some for the Seminole, Okla., field and one for the Roxana Petroleum Corp., for 50,000 tons. In a general way, however, curtailed oil well drilling programs held demand in check all year. Jobbers ordered sparingly, aiming to keep well balanced small stocks.

This was largely the case of standard full weight merchant pipe jobbers, although their turnover was somewhat larger due to sustained building programs. Hunger for business in third quarter developed price concessions and Sept. 1 the National Tube Co. adopted the tactics of independent producers of quoting lower figures to coax in attractive orders. A new card was not issued but that of April, 1923, was subjected to an extra 5 per cent discount. Early in November oil country goods became quotable at 10, 2½ and 10 off instead of the usual 10 and 2½ off.

Competition on seamless tubing was particularly vigorous and makers entering that field floundered trying to find some quotational ground. At times as much as five to seven extra 5 per cents were granted from list. Demand from oil fields was meager most all year and negligible from automotive lines after March. Other consuming lines, however, furnished fairly large tonnages and splendid demand is prophesied for 1928.

Changes in Discounts on Steel Pipe

Jobbers, Carloads, Base, Pittsburgh

	Sizes in inches	Butt Basing Black	Weld Discount Galv.
Jan. 1, 1910 to Oct. 1, 1910	½ to 6	78	68
Oct. 1, 1910 to Oct. 2, 1911	2 to 3	80	70
Oct. 2, 1911 to Dec. 1, 1911	2 to 3	81	74
Dec. 1, 1911 to Dec. 15, 1911	2 to 3	83	76
Dec. 15, 1911 to Jan. 1, 1912	2 to 3	83	76
Jan. 1, 1912 to July 1, 1912	2 to 3	82	75
July 1, 1912 to July 24, 1912	2 to 3	82	75
July 24, 1912 to Sept. 10, 1912	2 to 3	81	74
Sept. 10, 1912 to Jan. 1, 1913	2 to 3	80	72
Jan. 1, 1913 to April 12, 1913	¾ to 3	80	71½
April 12, 1913 to May 27, 1913	¾ to 3	79½	71
May 27, 1913 to Aug. 8, 1913	¾ to 3	79	70½
Aug. 8, 1913 to Oct. 27, 1913	¾ to 3	80	71½
Oct. 27, 1913 to Feb. 2, 1914	¾ to 3	80	71½
Feb. 2, 1914 to April 20, 1914	¾ to 3	79½	71
April 20, 1914 to Nov. 2, 1914	¾ to 3	80	71½
Nov. 2, 1914 to Feb. 11, 1915	¾ to 3	82	72½
Feb. 11, 1915 to May 1, 1915	¾ to 3	80	69½
May 1, 1915 to June 11, 1915	¾ to 3	79	68½
June 1, 1915 to June 17, 1915	¾ to 3	79	63½
June 17, 1915 to Aug. 5, 1915	¾ to 3	79	57½
Aug. 15, 1915 to Nov. 1, 1915	¾ to 3	79	63½
Nov. 1, 1915 to Jan. 4, 1916	¾ to 3	78	63½
Jan. 4, 1916 to Jan. 20, 1916	¾ to 3	77	62½
Jan. 20, 1916 to Feb. 15, 1916	¾ to 3	76	60½
Feb. 15, 1916 to Feb. 29, 1916	¾ to 3	75	59½
Feb. 29, 1916 to Mar. 15, 1916	¾ to 3	74	57½
Mar. 15, 1916 to Mar. 29, 1916	¾ to 3	73	55½
Mar. 29, 1916 to April 21, 1916	¾ to 3	72	53½
April 21, 1916 to July 24, 1916	¾ to 3	70	50½
July 24, 1916 to Sept. 7, 1916	¾ to 3	70	55½
Sept. 7, 1916 to Nov. 1, 1916	¾ to 3	69	55½
Nov. 1, 1916 to Nov. 15, 1916	¾ to 3	69	55½
Nov. 15, 1916 to Dec. 4, 1916	¾ to 3	68	54½
Dec. 4, 1916 to Dec. 30, 1916	¾ to 3	66	52½
Dec. 30, 1916 to Feb. 14, 1917	¾ to 3	64	56½
Feb. 14, 1917 to Mar. 5, 1917	¾ to 3	62	48½
Mar. 5, 1917 to April 2, 1917	¾ to 3	60	46½
April 2, 1917 to Nov. 6, 1917	¾ to 3	55	41½
Nov. 6, 1917 to Jan. 1, 1919	¾ to 3	51	37½
Jan. 1, 1919 to Mar. 21, 1919	¾ to 3	54	40½
*Mar. 21, 1919 to April 13, 1921	¾ to 3	57½	44
April 13, 1921 to July 7, 1921	1 to 3	62½	50
July 7, 1921 to Sept. 16, 1921	1 to 3	64½	52
Sept. 16, 1921 to Dec. 15, 1921	1 to 3	68½	56
Dec. 15, 1921 to Aug. 17, 1922	1 to 3	71	58½
Aug. 17, 1922 to Oct. 19, 1922	1 to 3	68	56½
Oct. 19, 1922 to Feb. 13, 1923	1 to 3	66	54½
Feb. 13, 1923 to April 19, 1923	1 to 3	64	52½
‡April 19, 1923 to date	1 to 3	62	50½

*Level adopted by independent companies Dec. 31, 1920.

‡Since Sept. 21, 1924, Pittsburgh and Lorain basing discounts, jobbers' carloads, Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount or $4 per ton higher net. Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

Composite Market Record

Weekly and Monthly Averages of Fourteen Iron and Steel Products, 1924-1927

Compiled by Iron Trade Review

1927	
Dec. 14	$35.09
Dec. 7	35.10
Nov. 30	35.17
Nov. 23	35.24
Nov. 16	35.36
Nov. 9	35.45
Nov. 2	35.51
Average for November	35.35
Oct. 26	35.51
Oct. 19	35.55
Oct. 12	35.55
Oct. 5	36.05
Average for October	35.67
Sept. 28	36.09
Sept. 21	36.10
Sept. 14	36.25
Sept. 7	36.27
Average for September	36.18
Aug. 31	36.27
Aug. 24	36.23
Aug. 17	36.23
Aug. 10	36.24
Aug. 3	36.26
Average for August	36.25
July 27	36.36
July 20	36.40
July 13	36.38
July 6	36.49
Average for July	36.41
June 29	36.50
June 22	36.65
June 15	36.70
June 8	36.72
June 1	36.40
Average for June	36.59
May 25	36.66
May 18	36.82
May 11	36.85
May 4	36.70
Average for May	36.76
April 27	36.64
April 20	36.64
April 13	36.81
April 6	36.81
Average for April	36.73
Mar. 30	36.89
Mar. 23	36.87
Mar. 16	36.87
Mar. 9	36.79
Mar. 2	36.75
Average for March	36.83
Feb. 23	36.75
Feb. 16	36.75
Feb. 9	37.06
Feb. 2	37.32
Average for February	36.97
Jan. 26	37.38
Jan. 19	37.47
Jan. 12	37.78
Jan. 5	38.06
Average for January	37.68

1926	
Dec. 29	38.08
Dec. 22	38.12
Dec. 15	38.22
Dec. 8	38.24
Dec. 1	38.46
Average for December	38.22
Nov. 24	38.50
Nov. 17	38.47
Nov. 10	38.43
Nov. 3	38.30
Average for November	38.43
Oct. 27	38.18
Oct. 20	38.14
Oct. 13	38.13
Oct. 6	37.85
Average for October	38.08
Sept. 29	37.82
Sept. 22	37.86
Sept. 15	37.78
Sept. 8	37.76
Sept. 1	37.58
Average for September	37.76
Aug. 25	37.61
Aug. 18	37.61
Aug. 11	37.61
Aug. 4	37.61
Average for August	37.61
July 28	37.61
July 21	37.67
July 14	37.69
July 7	37.74
Average for July	37.68
June 30	37.74
June 23	37 58
June 16	37 60
June 9	37.68
June 2	37.84
Average for June	37.69
May 26	$38.00
May 19	38.14
May 12	38.34
May 5	38.39
Average for May	38.22
Apr. 28	38.39
Apr. 21	38.47
Apr. 14	38.53
Apr. 7	38.54
Average for April	38.48
Mar. 31	38.86
Mar. 24	38.89
Mar. 17	38.85
Mar. 10	38.90
Mar. 3	38.90
Average for March	38.88
Feb. 24	38.90
Feb. 17	38.90
Feb. 10	38.98
Feb. 3	39.00
Average for Feb.	38.95
Jan. 27	39.01
Jan. 20	39.15
Jan. 13	39.26
Jan. 6	39.26
Average for January	39.17

1925	
Dec. 30	$39.24
Dec. 23	39.10
Dec. 16	39.10
Dec. 9	39.10
Dec. 2	39.17
Average for December	39.14
Nov. 25	38.89
Nov. 18	38.84
Nov. 11	38.76
Nov. 4	38.44
Average for November	38.73
Oct. 28	37.95
Oct. 21	37.61
Oct. 14	37.43
Oct. 7	37.43
Average for October	37.61
Sept. 30	37.42
Sept. 23	37.40
Sept. 16	37.35
Sept. 9	37.35
Sept. 2	37.21
Average for September	37.35
Aug. 26	37.21
Aug. 19	37.45
Aug. 12	37.45
Aug. 5	37.43
Average for August	37.39
July 29	37.45
July 22	37.45
July 15	37.45
July 8	37.45
July 1	37.45
Average for July	37.45
June 24	37.33
June 17	37.43
June 10	37.65
June 3	38.01
Average for June	37.60
May 27	38.04
May 20	38.21
May 13	38.49
May 6	38.75
Average for May	38.37
Apr. 29	38.85
Apr. 22	39.05
Apr. 15	39.43
Apr. 8	39.69
Apr. 1	40.22
Average for April	39.45
Mar. 25	40.33
Mar. 18	40.63
Mar. 11	40.83
Mar. 4	41.02
Average for March	40.70
Feb. 25	41.02
Feb. 18	41.06
Feb. 11	41.22
Feb. 4	41.22
Average for February	41.13
Jan. 28	41.00
Jan. 21	41.10
Jan. 14	41.05
Jan. 7	40.92
Average for January	41.02

1924	
Dec. 31	$40.70
Dec. 24	40.70
Dec. 17	40.14
Dec. 10	39.94
Dec. 3	39.58
Average for December	40.21
Nov. 26	39.46
Nov. 19	39.21
Nov. 12	38.79
Nov. 5	38.56
Average for November	39.00
Oct. 29	38.61
Oct. 22	38.65
Oct. 15	38.65
Oct. 8	38.67
Oct. 1	38.67
Average for October	38.65
Sept. 24	38.87
Sept. 17	38.95
Sept. 10	39.15
Sept. 3	39.23
Average for September	39.05
Aug. 27	39.35
Aug. 20	39.37
Aug. 13	39.31
Aug. 6	39.29
Average for August	39 33
July 31	39.47
July 24	39.53
July 17	39.89
July 10	39.91
July 3	40.13
Average for July	39.78
June 25	40.37
June 18	40.55
June 11	40.66
June 4	40.84
Average for June	40.61
May 28	41.14
May 21	41.22
May 14	41.56
May 7	41.58
Average for May	41.38
Apr. 30	41.72
Apr. 23	42.01
Apr. 16	42.47
Apr. 9	42.55
Apr. 2	42.91
Average for April	42.33
Mar. 27	43.13
Mar. 20	43.25
Mar. 13	43.27
Mar. 6	43.29
Average for March	43.24
Feb. 28	43.39
Feb. 21	43.53
Feb. 14	43.53
Feb. 7	43.49
Average for February	43.49
Jan. 30	43.39
Jan. 23	43.35
Jan. 16	43.29
Jan. 9	43.21
Jan. 2	43.06
Average for January	43.26

Monthly Averages During Earlier Years

1923	
December	43.02
November	42.81
October	43.84
September	44.64
August	44.87
July	45.39
June	46.46
May	47.52
April	47.01
March	45.31
February	42.61
January	41.17
Average for year	44.55

1922	
December	$40.53
November	42.08
October	43.60
September	43.79
August	39.79
July	37.50
June	36.96
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
Average for year	38.76

1921	
December	$33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	51.98
Average for year	40.86

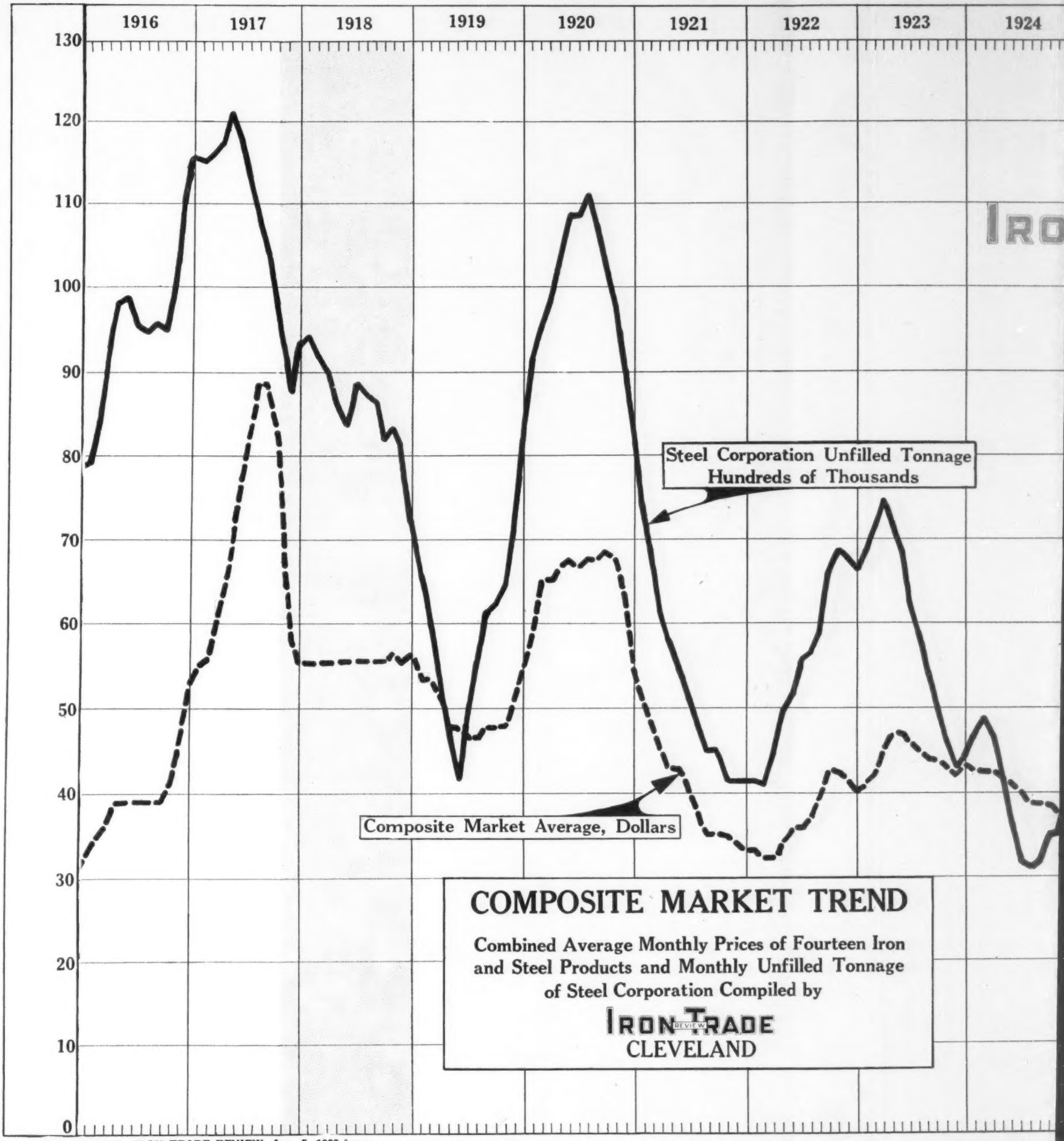
1920	
December	54.04
November	63.75
October	68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59

1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	50.32

1918	
December	57.24
November	55.67
October	57.53
September	56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68

1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10

1916	
December	53.68
November	46.77
October	41.50
September	39.97
August	39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50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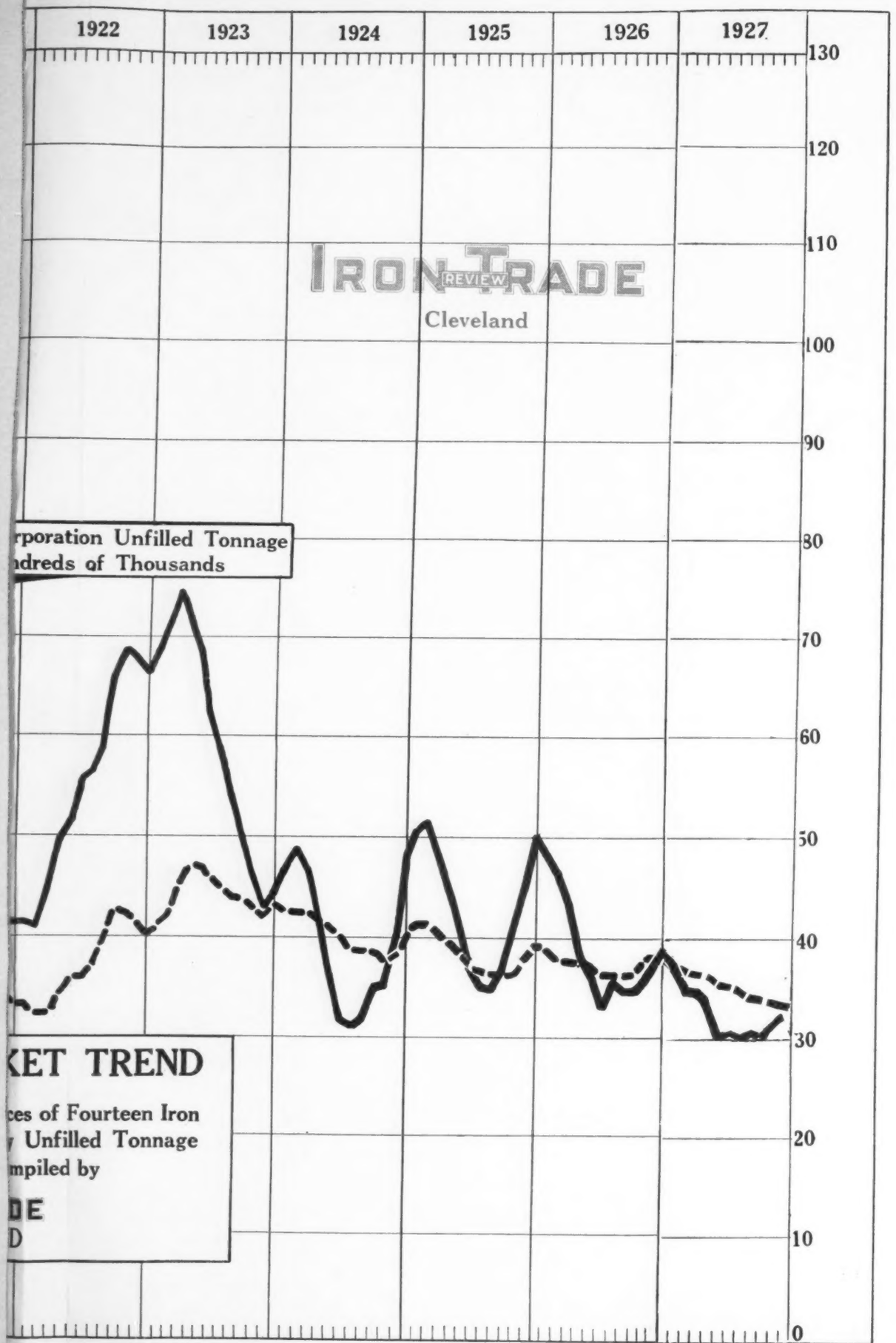
Steel Corporation Unfilled Tonnage
Hundreds of Thousands
Composite Market Average, Dollars
COMPOSITE MARKET TREND
Combined Average Monthly Prices of Fourteen Iron and Steel Products and Monthly Unfilled Tonnage of Steel Corporation Compiled by
IRON TRADE REVIEW
CLEVELAND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Scrap Caught in Cross Currents

Small Demand Makes Collection Unprofitable—Change in Steel Practice Limits Requirements—Direct Dealing of Producer and Consumer Squeezes Dealer —Fluctuations Milder and Steady Downward Tendency Shown

PRICE tendencies of iron and steel scrap pointed generally downward throughout 1927. The trend of 1926 and former years toward restrained fluctuations in consumer prices continued in 1927 with a more pronounced course.

Active consumer buying of heavy melting steel actually was compressed in a range of $12 to $13.50 in the Chicago district, although the price, in the absence of consumer activity, did reach $14 for a brief time. The low monthly average of melting steel for the year in that district in November was at $11.50, with some sales even lower.

At Pittsburgh, heavy melting steel dropped $2 in first half and by June was selling at $14.75, the lowest in six years. Some users at Ohio river points bought in November at as low as $14.25. Others nearer Pittsburgh paid $14.50 during the closing two months. Blast furnace grades received little or no attention in the later months and prices around $11 were developed on turnings at Pittsburgh. Steel foundry operations, at times as low as 20 per cent of capacity, caused a restricted sale of steel specialties.

Overproduction of iron and steel scrap, particularly heavy melting steel, was more pronounced in the Chicago market than in previous years.

The Year's Range

	High	Low
Heavy melting, Pittsburgh	$17.25	$14.00
Heavy melting Chicago	13.75	11.00
Heavy melting, eastern Pa.	17.25	13.50

Low prices at points of consumption in the East discouraged efforts at collecting scrap. Large tonnages of scrap went into dump piles in New England. Casualties among yard dealers and brokers were high at Chicago. Eight to ten withdrew from the market, partly because of the deepening wedge between consumers and dealers, more scrap passing directly from producers to consumers.

Consumption in the East was greatly reduced late in the year by discontinuance by the Bethlehem Steel Co. of the use of scrap at Sparrows Point, Md. This interest now is duplexing at that point.

In the early spring, automobile scrap rejected at Chicago was shipped all-rail into the Cleveland district. A cargo of 1600 tons of nickel steel scrap was received by a Chicago district melter direct by boat from Birkenhead, Eng.

Consumers in the West exercised their prerogative of inspection and rejections were multiplied. The year at Chicago was marked by consistent consumption of cast borings. When the three important consumers came in the market simultaneously actual shortages developed. After midyear borings consumers in some cases adopted substitutes and purchased busheling for blast furnaces. The differential of borings and heavy melting steel was narrowed sharply.

Pittsburgh scrap dealers found sources of supply cut off. Detroit scrap, particularly compressed sheets, was stopped at Buffalo and other intermediate points. Often the Pennsylvania railroad's monthly collection of scrap went into the Canton-Warren-Massillon districts, even the tonnage from the Conway, Pa., yards near Pittsburgh, being attracted elsewhere on bids higher than Pittsburgh dealers or consumers were willing to pay. Thus Pittsburgh buyers had to pay 15 to 25 cents above prevailing quotations.

Coke By-Products Hold to Fairly Steady Level

UNUSUAL steadiness characterized light oil distillates in 1927. While demand did not equal that of the preceding year, curtailment in iron and steel production, particularly during last half, contributed a stabilizing influence. Toluol and solvent naphtha prices were unchanged since early in the preceding year, and pure and 90 per cent benzols were virtually stationary through the closing seven or eight months. Heavy buying of toluol for lacquer production continued. Notwithstanding comparative slackness in the automotive industry, requirements for lacquer expanded rapidly. This had a direct bearing on toluol and in less degree on commercial xylol, and indirectly on solvent naphtha.

The Year's Range

	High	Low
Benzol	$0.24	$0.23
Toluol	0.35	0.35
Sulphate ammonia	2.525	2.25

Greatly influencing sulphate of ammonia was foreign competition. Domestic prices were forced steadily downward, to drop off decidely in July and August, at the time of sea-

Coal Tar Products Market in 1927

F.o.b. Producers' Works

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Benzol	$0.235	$0.235	$0.23	$0.24	$0.24	$0.23	$0.23	$0.23	$0.23	$0.23	$0.23	$0.23
Toluol	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Solvent naphtha	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Phenol	0.22	0.22	0.22	0.21	0.21	0.20	0.19	0.19	0.195	0.195	0.195	0.195
Naphthalene flakes	0.06	0.625	0.0625	0.0625	0.06	0.06	0.06	0.055	0.055	0.06	0.06	0.06
Naphthalene balls	0.07	0.725	0.0725	0.0721	0.07	0.07	0.07	0.065	0.065	0.07	0.07	0.07
*Sulphate of ammonia	2.50	2.525	2.525	2.50	2.42	2.42	2.25	2.25	2.30	2.325	2.325	2.325

*Delivered basis.

sonal contracting by the fertilizer industry. The market then showed a slight upward tendency, stimulated in part by a promising outlook in the South. Germany, with synthetic sulphate, was the principal foreign competitor. Naphthalene was featured by exceptional steadiness through most of the year.

Tin Plate Output, Price Down as Canning Falls

REDUCED packs of vegetables and fish adversely affected tin plate consumption in 1927 by several million base boxes. Planting and packing were off because of large carryovers; peach pack was lower on account of cold weather; salmon pack in the Alaska-Puget Sound-Columbia river districts was about 50 per cent of 1926. Many made-up cans are being carried over into 1928. Tin plate output has been doubling every decade. Considerable progress must be made before 1930 to overcome the loss in 1927.

Boom conditions of 1926 carried over into 1927 and by March makers had enjoyed practically full operations four or five months. American Sheet & Tin Plate Co. was really on a 103 to 108 per cent basis for weeks. By March schedules declined and except for an upturn in October steadily lost until in late December the average was about 60 per cent.

The year opened at the official price in force since May, 1923, $5.50 per base box, 100 pounds, Pittsburgh. Price concessions, however, were more numerous and inquiries were placed down to $5.25. The latter was recognized when on Dec. 1 American Sheet & Tin Plate Co. announced it as its first quarter price, followed by independent makers. Preferential prices to large tonnage buyers are 10 to 15 cents lower. Low pig tin prices aided the decline.

Better merchandising methods kept stock accumulations low and prices were better. While $4.65 and $4.80 were quoted late in the year, in the early months $4.75 and $4.90 ruled in the East.

Exporters had numerous surprises. Purchases were made for shipment to Siberia, Italy, Argentine, China and Japan early in the year, but later Japanese orders were placed with the British because American price exceeded by $10 per ton the 1926 figure. Two tin mills in Japan and one in India are taking business.

Buying of Wire Products Moderate but Steady

DEMAND for wire and wire products, while moderately active in most lines, failed to keep mill operations at the rate of the preceding year. Mills operated at 50 to 60 per cent. Mills again carried the burden of stocks.

While early in the year the automotive industry took large quantities of wire, nails and other products, this fell off in March and did not return until late November.

In the Chicago district demand from manufacturing lines started off well, the first half of January showing a 10 per cent increase over the preceding month. Woven fencing showed steady activity most of the year.

Despite early weather conditions and floods, activity in agricultural areas exceeded expectations. In October demand from farm areas was ahead of 1926. In the West shipments to automotive lines dropped off in the second quarter 10 to 15 per cent, but picked up somewhat in the last two months. Building slumped at Chicago in October.

The Year's Range

	High	Low
Nails, Pittsburgh.....	2.65c	2.45c
Wire, Pittsburgh.....	2.50c	2.35c

While wire and wire nail bases at Pittsburgh, Cleveland and Chicago early in the year were firm at 2.50c and $2.65, respectively, in February a $2 reduction, which started in the West, became general. In May, various methods of meeting competition were adopted. By early June nail sales were made at $2.50, Pittsburgh and Cleveland. Some manufacturers June 27 took a stand on $2.55. Gradually this slipped and while the wire base appeared firm at 2.40c, nails again went to $2.50 and even to $2.45 on attractive quantities in November. A new nail card of extras was issued Dec. 1 and $2.55, base, was again quoted.

In the East plain wire held steadily through the year. During second quarter some large jobbers bought nails as low as $2.25, Pittsburgh.

Refractories Users Put Stock Burden on Makers

EXPERIENCING piecemeal buying practically all of 1927, refractory makers have had to maintain large stocks to supply customers' wants quickly. In the first half a few noteworthy large lots were booked when brick orders for the new open-hearth furnaces of Ford Motor Co. were divided between two makers and when considerable brick for coke oven installations by Koppers Co. and other oven builders was awarded. It was because it had such large backlogs of coke oven brick, mostly for Carnegie Steel Co.'s Clairton works, that one prominent maker of silica brick was able to operate at 75 to 85 per cent for several months when other makers were 50 to 60 per cent.

During last half, repairs and an occasional relining for a blast furnaces alone engaged buyers, although considerable new construction work is scheduled for consideration early in 1928. Small orders kept most kiln operations to a 50 per cent average.

Early in January silica brick dropped $3, to $40 for Pennsylvania makers and $49 for Illinois kilns. Birmingham makers followed later. On the strength of higher costs presented by coal strike difficulties, the price rebounded by April 1 although as late as June 30 some makers were still working out of low-priced $38 arrangements booked late in 1926. Fire clay brick also advanced $3 late in March to $43, which was the minimum for the rest of the year. That was the flat market price for several weeks and then certain brands were quoted at as high as $46. Chrome and magnesite brick were $45 and $65 all year and more chrome brick per ton of steel was used than ever.

Shape Tonnage Almost Record

Bookings Exceed 1926, Second Highest, and May Top 1925, the Heaviest of History —Shipments Also Close Second—Price Conditions Unsettled in Spite of Large Activity—Special Sections Announced by Leading Mills

STRUCTURAL bookings established close to if not a new record in 1927. Preliminary estimates point to only a slight falling off at best from the high total of 1925, and full returns may show a small increase. In any event, bookings will exceed those of 1926, which to that time were the second highest in the history, and will include more than 2,700,000 tons. A new monthly record was established in July, when 308,460 tons was placed, according to the department of commerce.

Shipments also have come close to a new record, although it is doubtful if they have surpassed the preceding year, which opened with an unusually heavy backlog. Nevertheless, tonnage moved with the same efficiency and dispatch so notable in the preceding year. There were virtually no shop labor disturbances and no transportation difficulties, and nothwithstanding the heavy tonnage handled, there was no lack of capacity.

Apparently ample capacity, combined with evidences of pessimism over the building outlook and backwardness on the part of many fabricators in adjusting to general hand-to-mouth conditions, contributed greatly to weakness in fabricated material prices, and which in turn, with other factors, exerted a depressing influence on shape prices, so particularly noticeable in the East.

In fact, the steadiness in shapes, pronounced in the preceding year, gave way to highly unsettled conditions in several months of 1927, and

The Year's Range	High	Low
Shapes, Pittsburgh.....	2.00c	1.75c

to a weakness through practically the entire year.

Starting at around 2.00c, Pittsburgh, and 2.10c, Chicago, the market soon began to move downward. At Chicago, eastern competition was a leading factor, but it was not until August that 1.90c became general in that district. Then they dropped to 1.85c, where they remained until October, when the market began to advance slowly.

Prices underwent greater fluctuation in the Pittsburgh and eastern districts, particularly in the latter, where the market went well below 1.75c, Pittsburgh equivalent, during the midquarters. This unsettled condition prompted the leading seller to announce a 1.75c, Pittsburgh, minimum, in October and to follow it up with similar action later, and with stimulating effect, although the market did not regain the lost ground.

An interesting development was a list of special sections by the leading seller, and a substantial amplification of an existing list by a prominent eastern independent. This resulted in sharp competition extending into far-reaching territories and served to focus greater attention on what was believed to be a strong need for simplification.

Of significance in this connection was the resolution passed at the annual fall meeting of the American Institute of Steel Construction, urging the hot steel industry to confer with the department of commerce in an effort to reduce the number and variety of structural steel sections.

Despite the heavy tonnage commercial construction declined, although not greatly and not nearly as much as was expected early in the year. Industrial building also showed a slight decline, due in a measure to fewer hydro-electric power stations and similar construction.

The principal increase was in bridgework, especially toll bridges. This ran into a heavy tonnage, with the largest individual letting calling for close to 60,000 tons of shapes for the Hudson river bridge at New York.

Numerous miscellaneous projects requiring 10,000 tons and over, were placed during the past year. An office building in New York required 25,000 tons, another in that city 16,000 tons and a bridge in Cleveland, 20,000 tons.

Following is a comparative statement of computed bookings, compiled by the department of commerce:

	1924	1925	1926	1927
Jan.	210,960	173,850	184,440	171,720
Feb.	213,890	176,900	184,440	219,420
March	205,100	210,450	209,880	209,880
April	193,380	231,800	222,600	238,500
May	175,800	207,400	235,320	206,700
June	190,450	262,300	232,140	203,520
July	202,170	247,650	219,420	308,460
Aug.	172,870	237,900	254,400	248,040
Sept.	193,380	247,050	187,620	241,680
Oct.	193,380	274,500	203,520	263,940
Nov.	246,120	216,550	193,980	.....
Dec.	231,470	228,750	225,780	.....
Total	2,428,970	2,714,500	2,553,540	.....

Small-Lot Sales Curb Profits in Steel Bars

EXTREME short-range buying, high operating costs for mills, narrow margins of profit and a downward price trend characterized the soft steel bar market in 1927.

The character of orders in the Chicago district a part of the third and fourth quarters distressed producers. In the summer, mills considered issuing extras on odd-lot sales. Much business ordinarily going to warehouses was offered to mills and mills, lacking tonnage orders, accepted at low prices.

Low inventory policies of buyers in

The Year's Range	High	Low
Bars, Pittsburgh.....	2.00c	1.75c

the Pittsburgh district were followed closely. Except a short period in February, delivery dates seldom were much deferred. Consequently little incentive was offered to anticipate requirements.

During the first quarter and early in the second, Chicago district bar buying approximated the similar period of record 1926. Cold finished bar interests in the West broke records in March.

Estimates are that bar mills averaged 60 per cent operations. As in 1926 and 1925, soft steel bars accounted for about half of the output of heavy finished steel at Chicago.

The automobile slump, starting in March, affected specifications in the Pittsburgh territory, since most of its bars go to cold finishers, 50 per cent or more of whose trade is automotive. Demand there fluctuated in the middle six months but gained in

last quarter, particularly in December, when contracting for 1928 started.

In Pittsburgh, price resistance took quotations from 2.00c in January to 1.90c by March. Tonnage buyers paid 1.85c in April but by June 1.80c developed. In the third quarter, a 1.75c level was announced and Nov. 10 the price was raised to 1.80c. On some single carload lots, particularly if made up of mixed sizes, grades and shapes, 1.85c and 1.90c were obtained in the final two months.

Weakness in finished material in the eastern markets affected western bar mill products early. Eastern competition then began a steady hammering at finished prices at Chicago, and bars, after resistance, dropped from 2.10c to 2.00c early in February. It was not until late August that 1.90c became general. This soon dropped to 1.85c, and although mills made a strong effort to re-establish 1.90c the market remained pegged at 1.85c until the advance of $1 Nov. 10.

In the late spring farm equipment makers developed momentum, and these operations continued heavy, providing a mainstay of demand in the Chicago district. Including tractor works, implement activity was the best in about ten years.

Alloy steel bars followed the automotive industry. Prices were weak and drooping most of the year. Alloy operations averaged 75 per cent, but in the later months dropped below 60. Billet reinforcing bars were quiet in the spring and summer, but autumn business forged ahead of 1926. Rail steel bars in the West had the advantage of a more uniform business. The aggregate of rail steel reinforcing bar business was 15 per cent under 1926. Billet bars were shaded at various times by heavy competition. Rail steel bars hit their weak point late in the year. At Chicago billet bar dealers also handled rail steel.

Foreign soft steel and concrete bars were a factor on the eastern seaboard and were obtainable at about the same prices, delivered, as domestic bars at Pittsburgh. Most foreign steel was bought by jobbers.

New Uses for Plates Fail to Maintain Volume

PLATE demand in 1927 was only fair. Business reached its greatest volume in fourth quarter. Even then, however, eastern mills were unable to maintain operations above 50 to 60 per cent of capacity, while production elsewhere, aside from Chicago, was not much better.

Perhaps the most important development in the plate market came Dec. 8 when Bethlehem Steel Co. announced a new price schedule. This called for f.o.b. mill prices and placed Bethlehem in the position of following the action of the United States Steel Corp., in 1924, of abandoning the Pittsburgh plus method of quoting. As a result of Bethlehem's action, it is expected that plates in the eastern district generally, as has been the case at Chicago and Birmingham, will sell on a mill basis. Bethlehem's new price resulted in slightly reducing prices to consumers on and near the seaboard but this advantage to eastern mills does not apply to points much west of Coatesville.

The Year's Range	High	Low
Plates, Pittsburgh.....	1.90c	1.75c

Plate consumption reflected increases in some directions and shrinkages in others. Some mills believe gains balanced losses. The increase in consumption which appears to have been most pronounced is the greater use of plates for oil storage tanks for domestic heating plants; such tanks absorbed a large tonnage. There continues a greater use of thick plates as base plates for columns in building foundations, rolled plates now being employed quite generally in place of cast base plates. A substantial improvement has been reflected in the demand for floor plates; such plates, rolled with raised patterns, now are employed extensively for treads. Many new uses of a small type have developed for plates; they now are being used extensively for making loom-heads for textile mills. These were malleable castings.

Railroad buying of plates was much under normal. The small volume of car and locomotive buying resulted in abnormally slow plate demand in those directions. Shipbuilding continued to take small tonnages, although good tonnages went into barges for operation on inland waterways. Consumption of plates by the boiler making industry continued to shrink, first because of the elimination of isolated boiler plants in favor of the central power station, and second because forged drums now are used extensively instead of plates for boiler heads. Less plate tonnage now is being consumed in construction of gasholders because a new type of holder requires fewer plates.

Process Change Cuts Cast Iron Pipe Profits

WITH the trend of cast iron water pipe prices steadily downward makers had difficulty in maintaining a stable market, particularly in the last six months when sporadic public demand and wavering quotations brought forth business under production costs.

Prices were more satisfactory in the first six months. Several sellers in the Chicago district reported January business the heaviest in years.

In the East, severe competition forced prices to the lowest point in more than ten years. The decline continued until Fall, when the market steadied and ended the year with a slight upward tendency. Many are inclined to regard the price cutting of the past year as due fundamentally to changes in processes.

The Year's Range	High	Low
Birmingham	$37.00	$28.00
Chicago	47.20	34.20
New York.....	51.60	36.80

Foreign pipe was not a formidable competitor in the West. On two occasions French pipe entered the Detroit market. French sellers in May on 3000 tons bid $41.20, delivered, the next lowest bid by a domestic producer being $41.70, delivered. The project later was readvertised, the tonnage going to a domestic producer. French sellers Dec. 3 bid $35.05, delivered, on 10,000 tons for Detroit. The next lowest domestic bid was $37.75, delivered. In the latter case the French pipe was offered for shipment from Montreal, and a water freight rate was thus involved. On the basis of the freight rate of $7.92 from Birmingham to Detroit, the French base was $27.13, Birmingham.

Price Weakness Marks Sheets

Highly Competitive Market, With Automotive Purchasing Much Below Normal, Brings Wide Swings—Stabilization Attempts Failures—Jobber Concessions Disturbing in East—Users' Stocks Kept Low

FLUCTUATING prices induced by highly competitive market conditions; hand-to-mouth purchases which often supplanted contracts altogether, and lowered consumption by automotive and allied lines were salient features of the 1927 sheet market. Ford Motor Co. was out of the market from April to late November, and similar lines were affected. To this can largely be attributed the lowered consuming rate, as indicated by accompanying statistics of independent manufacturers compiled by the National Association of Sheet and Tin Plate Manufacturers, representing about 72 per cent of the country's output. Shipments are placed at 2,950,000 tons or 450,000 tons under 1926.

Despite the decided drop in shipments, sheet usage in diversified lines was better than in 1926. It is generally conceded that had it not been for trade promotion through advertising and development of new applications, 1927 would have been much worse. Electrification of steel mills prompted greater consumption of electrical sheets, metal lath and other grades used in fireproof construction found wider application; implement manufacturers had a good year and their consumption was abnormally large; sheets for small bolted portable oil tanks were in demand and quantity production of iceless refrigerators accounted for no meager tonnage. Most of the year nearly all consuming lines, except car building and automobiles, were normal. All, however, hold much promise for 1928.

The year opened with black sheets at 2.95c, Pittsburgh, galvanized 3.80c, blue annealed 2.30c and autobody 4.25c. By March these levels had been dropped $2 to $4 but in May an effort was made to hold to 3.00c for black, 3.85c for galvanized, 2.25c for blue annealed and 4.25c for autobody. For several months these prices held, then the bottom again dropped out. Another effort at stabilization was launched in December. Blue annealed suffered severely from strip competition.

Operations when the year opened averaged 50 to 60 per cent; reached 80 or more in June and July; sank to 65 in September, and finished at 60. Most of the year Mahoning Valley mills operated without backlogs, in most cases starting Monday without knowing how long in the week the mills would run. Detroit provided a poor market; concessions made there in blue and autobody largely upset the market.

Certain small mills have arrangements with some New York jobbers whereby they sell sheets to them under the market. They view these jobbers as distributors and the concession as a commission. However, consumers believe they ought to be able to buy as low as a jobber and hence these commissions have made the New York market the weakest in the East.

As in other sections, sheet market at Chicago was one of light demand and piecemeal buying.

Year's Sheet Situation Summarized

1925	Total hot mills U. S.	Sales	Per cent of capacity	Production	Per cent of capacity	Shipments	Per cent of capacity
November	714	370,361	.....	336,021	.....	294,660	.....
December	712	319,504	.....	326,960	.....	293,579	.....
1926							
January	711	253,323	.....	328,643	.....	333,485	.....
February	712	181,101	61.0	299,553	100.9	290,026	97.6
March	712	304,233	89.8	319,132	94.2	320,623	94.7
April	711	249,866	77.1	294,811	91.0	288,759	89.1
May	710	201,743	64.3	264,541	84.3	267,299	85.1
June	710	284,319	89.0	268,448	84.0	262,231	82.0
July	710	352,414	113.6	239,764	77.2	264,025	85.1
August	710	283,055	88.6	293,703	92.0	281,602	88.2
September	710	448,147	140.3	307,459	96.2	302,198	94.3
October	710	212,029	68.3	314,598	101.4	301,474	97.2
November	712	185,235	57.8	278,455	86.9	262,797	82.0
December	712	240,862	73.1	238,345	72.3	219,498	66.6
1927							
January	712	261,357	84.9	256,856	83.5	239,019	77.7
February	712	241,951	84.5	282,171	97.4	261,412	90.3
March	712	345,900	104.7	359,340	108.8	338,436	102.5
April	712	292,965	95.6	316,100	103.1	300,858	98.1
May	712	212,337	67.7	309,360	98.7	302,759	96.6
June	712	224,321	71.6	300,706	95.6	281,395	89.7
July	719	230,715	.....	237,243	.....	253,034	.....
August	719	177,647	53.5	266,645	80.3	266,713	80.3
September	719	258,427	73.3	220,919	62.6	230,443	65.3
October	719	234,358	68.4	245,765	71.7	232,626	67.9
November	718	344,517	97.8	232,041	65.9	224,789	63.8

Tend to Longer, Heavier, Heat-Treated Rails

TENDENCY toward the use of heavier rails continued in 1927. The heaviest rail so far rolled is the 136-pound section for an eastern road. This continues unusual, however, and the average requirements call for 90 to 110-pound sections. The use of rails lighter than 90 pounds is declining. There has been further talk of rolling rails in 140, 145 and even 150-pound weights but nothing has come of it.

Rolling in lengths of 39 feet, which started in 1925, has become general, all mills now being equipped for these lengths. An increase in the length of cars to 52 feet has stimulated interest in even longer lengths of rail but developments along this line appear to be reserved for the remote future. For one thing, great expenditures would be necessary in equipping rail mills for producing longer lengths.

Increasing attention is being paid to the matter of heat-treating rails to lengthen their life and render them less likely to fail in service. A number of heats of rails have been heat-treated and are in track on a number of important railroads and their performance is being observed carefully. As to whether the roads will require large tonnages of rails to be heat-treated, however, remains to be seen. Study of physical characteristics, however. has caused some roads to make certain changes in analyses. For instance, the New York Central

during 1927 increased the manganese content of some of its rail tonnage and is expected to apply this change to an even greater tonnage in 1926.

Heavy rail contracting was done in October, November and December and this indicates that 1928 will be fully equal to the volume of rail business that came to the mills in 1927. Some of the railroads, notably the Pennsylvania, distributed the heaviest orders in their history. As in the past, most of those roads serving the Lake Superior iron ore country placed their rail business in direct proportion to the ore they were permitted to haul by railmakers. There is every expectation that the secondary buying of rails toward the end of the second quarter of 1928 will equal the high tonnage of 1927.

Light Rail Prices by Quarters, 1918-1927

Per Pound

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Jan. 1	3.00c	2.75c	2.45c	3.00c	1.50c	2.15c	2.10c	1.80c	1.80c	1.80c
April 1	3.00c	2.45c	3.25c	2.50c	1.60c	2.25c	1.95c	1.70c	1.70c	1.80c
July 1	3.00c	2.45c	3.75c	2.20c	1.75c	2.25c	1.90c	1.70c	1.70c	1.80c
Oct. 1	3.00c	2.45c	3.50c	1.65c	2.15c	2.15c	1.80c	1.60c	1.80c	1.80c

Domestic Ferroalloys Retain Hold on Market

IN 1927 domestic producers of ferromanganese retained most of the advantage gained in 1926 when, for the first time, except during the war period, they supplied most of the ferromanganese consumed in the United States. British producers sold a little more tonnage in 1927 in this country than in the preceding year but it was only a small portion of the total. As usual considerable tonnage came in from Canada and Norway. When the new year opened, the contract price on first half was $100 duty paid, tidewater, for all sellers. Two cuts of $5 developed, one in the latter part of April and the other in the latter part of May; these cuts were reported in connection with sales of English ferromanganese. Their effect was to cut contract prices to $90, placing the market on that basis for the rest of the year.

The price on all new business, extending to July 1, 1928, was advanced to $100, duty paid, tidewater, Dec. 1, an important importer of British ferromanganese taking the lead. All other sellers at once followed suit, and within a few days considerable tonnage had been placed on books at this price for first half delivery. A feature of the advance to $100 was that it encouraged consumers generally to take out as much tonnage as possible on their last half contracts at $90, thus bringing about unusual demand in December.

Imports and Domestic Production of Manganese Alloys—Imports of Manganese Ores

In Gross Tons

	Production		Imports		Imports
	Ferromanganese	Spiegeleisen	Ferromanganese	Spiegeleisen	Manganese ore
1927*	292,800	96,700	†27,860	.....	‡296,827
1926	319,510	74,070	†43,684	.....	‡364,307
1925	260,149	65,747	†77,597	.....	‡289,703
1924	199,418	107,135	†47,811	.....	‡231,393
1923	242,450	123,148	91,066	4,668	‡206,048
1922	150,039	68,589	95,007	8,157	374,451
1921	100,694	55,042	9,057	307	401,000
1920	286,365	110,685	59,254	5,234	601,437
1919	175,009	84,014	33,022	27	333,344
1918	325,133	303,535	27,168	.....	491,303
1917	328,000	187,000	51,800	.....	663,500
1916	275,204	187,233	90,928	.....	576,321
1915	144,260	114,556	55,263	200	313,985
1914	100,731	76,625	82,997	2,870	283,294
1913	119,495	106,980	128,070	77	345,090
1912	125,378	102,561	99,137	1,015	300,661
1911	74,602	104,013	80,263	20,970	176,852
1910	71,376	153,055	114,228	25,383	242,348
1909	82,209	142,831	88,934	16,921	212,765
1908	40,642	111,376	44,624	4,579	178,203
1907	55,918	283,430	87,400	48,994	209,021
1906	55,520	244,980	84,359	103,268	221,260
1905	62,186	227,797	52,841	55,457	257,033

*Estimated. †Includes Spiegeleisen. ‡Manganese content.

Spiegeleisen producers report they sold this metal to a greater number of consumers in 1927 than normally is the case. The principal market producer, New Jersey Zinc Co., produced spiegeleisen all year. E. J. Lavino & Co. had a run on this metal at their Reusens, Va., furnace, and the Delta Chemical & Iron Co. made some tonnage at its charcoal furnace at Wells, Mich.

Most of the ore consumed in the manufacture of ferromanganese in this country continues to come from the Caucasus. The market on the washed grade of Caucasian ore was 38 to 40 cents per unit, c.i.f. tidewater, all year and contracts have been made for 1928 at the same level. Domestic manganese ore production has been increased but this involves chiefly the manganese dioxide grade used in the manufacture of dry batteries.

Manganese ore was the subject of investigation by the United States tariff commission in 1927 in connection with possible increase in the duty. Considerable difference of opinion exists on domestic protection.

Special ferroalloys changed little through the past year except for a depression in tungsten. Low prices for the latter reflected lighter steel business but as most of the other alloy materials move under long contracts, they did not suffer from lighter use until the end of the year, when several cuts were announced for 1928 contracts.

Chrome and silicon ferroalloys had been unchanged, with some minor exceptions, since the increase in contract prices that applied at the beginning of 1925. In 1924 prices of these materials were the lowest since the war but 1928 prices as lately announced, remain a little above those prices. A year ago low-carbon ferrochrome was cut 2 to 3 cents. Ferrovanadium prices were unchanged in the new announcement. A year ago the new contract prices were cut 10 cents.

Ferrotungsten a year ago was about $1.05 a pound contained and sold down to around 90.00c, with a little recovery in December. Most of the tungsten, however, is sold in the ore for conversion, and the ore market was strong last winter but dull and weak after that until November. Wolframite tungsten ore sold up to $11.50 a short ton unit duty paid, then gradually down to $10, and near the end of the year had recovered a little more than 25 cents. Scheelite sold at a very narrow margin over wolframite.

Strip Prices Cut For Tonnage

Struggle for Business Brings Fluctuations and Low Levels in Hot Product—Cold Strip Steadier—Competition from Stripsheet Makers Also Cause of Unremunerative Prices—Buyers' Orders Are Piecemeal

PRICE upheavals and changes of method in quoting contributed the main pyrotechnics of the strip steel market in 1927. While for a short period after June 1 quotations were firmly upheld, in first half and final quarter the many price changes in hot strip were in direct contrast to the even course of quotations in 1926. The 1927 fluctuations in cold strip levels resembled those of 1926, except that the past year's prices were always on much lower levels. When competition did not come from aggressive makers who sought to buy orders with cut prices in times of low demand, it came from without, chiefly from sheet mills, directed against stripsheet makers. The latter product gained a further foothold in 1927, due to the increasing trend, in the automotive industry particularly, to fabricate large sections out of one piece.

Various expedients were resorted to in April and May and later to counteract the effects of the growing tendency among customers everywhere to specify small quantities, with attendant high production costs. Some for a time quoted a price per pound on wide strips while others simply met sheet and plate mill competition. In May a cold strip base price of 3.25c was decided upon for quantities up to 3 tons at a time; with graduated discounts on various amounts up to a minimum carload. By September this plan had been abandoned and a base price substituted for quantities up to 3 tons of a size and a 25-cent discount for quantities beyond 3 tons. In November and December, in the scramble for tonnage, particularly for first quarter 1928, price concessions of $5 per ton or more appeared on all grades, despite the fact that financial statements of stripmakers showed distinct losses for the first nine months. Some wide first quarter hot strips were booked at considerably below 2.00c and some cold at 2.75c for large quantities, following which the market showed a tendency to stiffen.

Stripmakers with diversified avenues for the sale of their product and faced with an apparently ever widening field of application, fared well in the matter of orders most of the year. Those who catered primarily to automotive and allied lines had a splendid first quarter, a fair second quarter but the remainder of the year was lean due to the lack of Ford Motor Co.'s tonnage and the effect that had upon other automobile builders. March was a heavy buying month, some orders doubtless being placed in anticipation of coal strike interference April 1.

Operating conditions were more or less favorable during first half, but at times in last half dropped to about 50 per cent of capacity. Western makers enjoyed more sustained support from the automotive industry, but felt the lack of this kind of buying the latter part of the third and the early part of the fourth quarter. The Laclede Steel Co. commenced operations in its new strip steel plant at Alton, Ill., early in the year, producing thin gages on 4-high stands.

At no place was competition for strip business more keen than at Detroit. When the year opened 2.30c, Pittsburgh, was quoted on hot strip over 6 inches and 2.50c on less than 6 inches. Weakness developed, and in mid-April up to 6 inches was priced at 2.30c, from 6 to 12 inches 2.10c, and 12 to 14 inches in various widths 2.30c. At the year's end 1.75c could be done on first quarter contracts.

Low Metal Prices Cause Curtailed Production

UNUSUALLY low prices in the face of a large world market characterized nonferrous metals in 1927. Good business of the previous two years gave production of metals such a stimulus that output kept expanding in the early part of last year and it was some time before producers were able to adjust to the slackness that began to develop in business at large in this country.

Increasing tonnage from mines and smelters was partly the result of improved methods and greater efficiency, and so the setback in prices, though the most severe in several years, was not as hard on most producers as a break of similar proportions in earlier years. Especially in lead and zinc newer processes of recovery from ores caused output to rise in greater proportion than the actual increase in labor.

Output of these two metals changed only a little from the high level reached early in the year, and similarly prices did not recover much after they had fallen 1½ cents or more, though some recovery came in July and again late in the year. All classes of domestic consumption were affected similarly. Domestic deliveries of zinc were close to 550,000 tons,

Average Monthly Nonferrous Prices in 1927

Prompt, wholesale prices, cents a pound

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Tin, spot Straits, New York	66.456	69.194	69.35	68.152	67.54	67.486	64.048	64.471	61.445	58.444	57.679	59.00
Copper, electro. del. Connecticut	13.25	12.934	13.336	13.053	12.876	12.618	12.774	13.261	13.211	13.227	13.570	14.12½
Zinc, prime western E. St. Louis	6.674	6.688	6.705	6.354	6.079	6.222	6.235	6.351	6.209	6.002	5.745	5.85
Lead, open market, New York	7.584	7.48	7.585	7.126	6.606	6.426	6.357	6.688	6.65	6.25	6.268	6.50
Aluminum, 98-99%, delivered*	26.196	25.775	25.625	25.625	25.44	25.375	25.375	25.375	25.375	25.145	24.756	24.75
Antimony, spot New York	14.40	14.506	12.761	14.266	12.885	12.365	11.865	11.828	11.119	11.028	10.777	11.12½
Nickel, ingot	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00

*Open market.

compared with nearly 584,000 in 1926.

The copper market made a much better showing than most other metal markets. Unbalanced output early in the year caused the price to break to 12.50c, the lowest in several years. Producers adjusted output and the market benefited. As the year went on export business, especially to Germany, served as more of an offset to slack domestic demand and stocks were cut. Early in December the market crossed 14.00c and kept on rising at the highest level in over a year.

Tin yielded to lighter business in this country, as world output continued a little larger than last year, but toward the end it became more apparent that consumption in Europe was taking up a larger proportion of the supply than had been generally realized. Then the price began to show some recovery and at 59.00c had regained several cents from the fall of about 15 cents from the high point of the autumn of 1926.

Aluminum was cut one cent early in the year and another cent in the autumn. In this metal also it was a case of output in this country and in Europe being somewhat larger than slack industry demanded. Consumption was really large but it suffered by comparison with 1926.

Prime western zinc had a severe break in the spring, after which it showed much firmness until autumn, when it slumped again, going down almost to 5.50c, East St. Louis, early in November, the lowest since 1922. Lead dropped to 6.20c, New York, at midyear, the lowest since 1923. For a time zinc sold higher than lead, as it did for many years, but in the past two months the relation of recent years returned with lead about ½-cent the higher.

Jobbers Adopting Extras to Offset Small Sales

HAMPERED by generally decreased business activity during last half and increasing keenness with which mills sought small tonnage orders, iron and steel warehouses in 1927 fell slightly behind sales totals of 1926. Buying was spotty throughout the country, most districts having good sales early in the year but in fourth quarter jobbers uniformly found business easing off.

Hand-to-mouth buying was more accentuated in 1927 than in 1926, and the size of individual orders booked by warehouses became so small that increasing sentiment was developed for adoption of quantity extras. In November several eastern sellers adopted mill, size and quantity extras for cold-rolled strip steel and quantity extras for cold-finished bars. In Boston several distributors adopted quantity extras on all products, but competition has prevented wide adoption of the new prices there.

Prices in 1927 were unusually stable, except on sheets. Weakness in mill levels was reflected in numerous shifts in sheet quotations, but the fluctuations in jobbers' prices were not as marked as those of the mills. Nails and wire, especially the former, continued a leading product in competition, prices in many cases being placed so low that the mill level barely was exceeded. This condition prevailed especially in Chicago, but a new card was issued Dec. 1 with an advance on bright nails. Nuts and bolts went on a list price basis in April, at 62½ off.

Territory around Baltimore and Philadelphia was subjected to severe price competition and the tendency was for all quotations to be reduced, in some cases proportionately more than mill revisions. Foreign steel was felt along the seaboard but not to any greater degree than in the several years preceding. More jobbers have been established in the Southeast, cutting down the territory of Baltimore sellers. Prices in Cleveland territory remained unusually steady for local delivery, with some shading in the first half for business in territory competitive to Pittsburgh.

Steet Ingot Production

Compiled by American Iron and Steel Institute

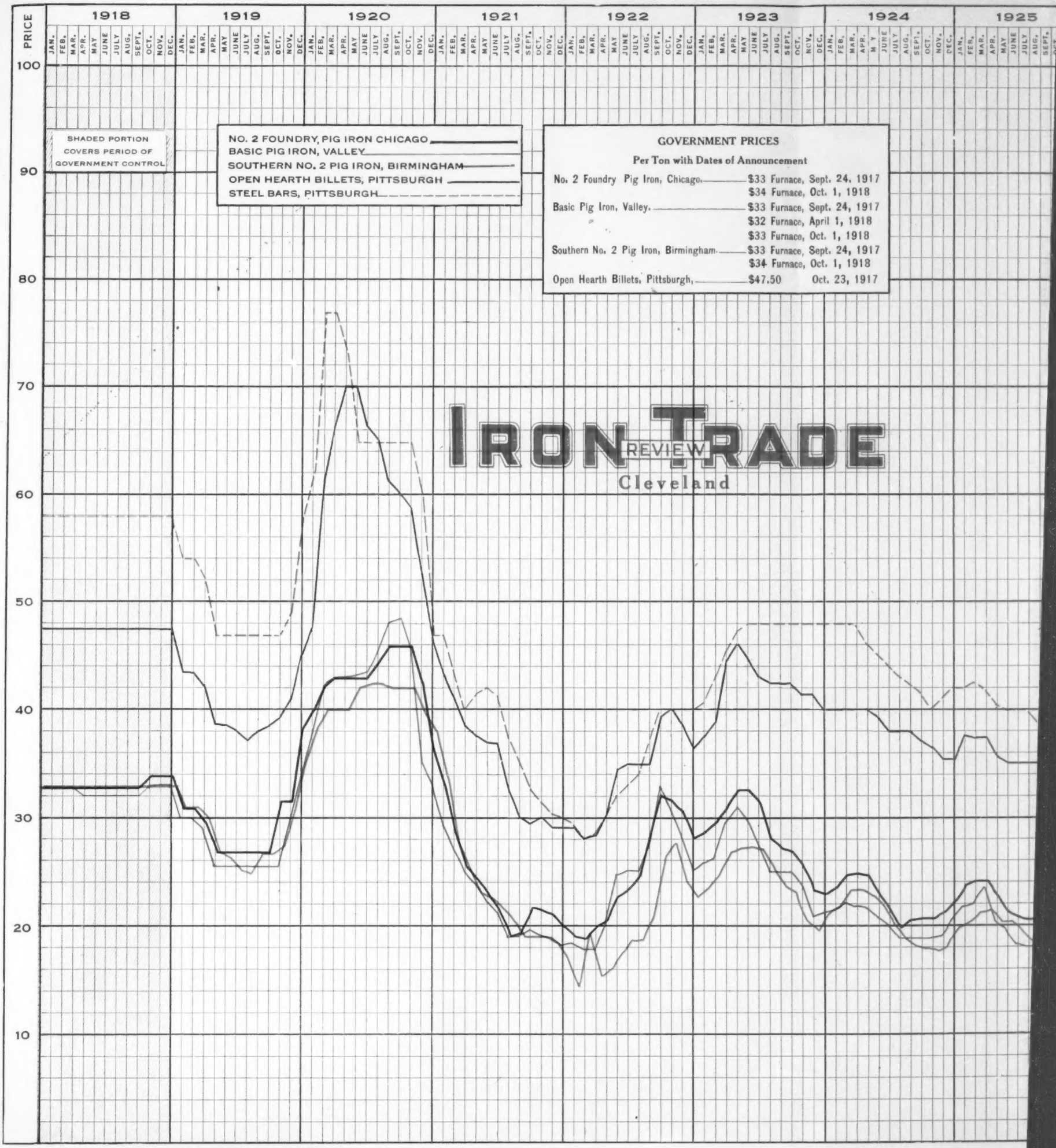
	1918		1919		1920		1921		1922	
	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.
January	2,641,196	97,822	3,650,845	135,216	3,524,026	130,519	2,517,042	96,809	1,891,857	72,764
February	2,724,962	113,540	3,177,311	132,388	3,401,760	141,740	1,998,705	83,279	2,071,772	86,324
March	3,727,632	143,370	3,127,481	120,288	3,916,960	145,073	1,794,777	66,473	2,814,667	104,247
April	3,791,184	145,815	2,631,087	101,196	3,132,458	120,479	1,386,897	53,342	2,902,240	116,090
May	3,939,580	145,910	2,266,109	83,930	3,423,178	131,661	1,446,181	55,622	3,218,794	119,215
June	3,695,352	147,814	2,607,015	104,281	3,538,971	136,114	1,146,350	44,090	3,127,775	120,299
July	3,731,532	143,520	2,946,465	113,326	3,327,785	127,992	917,824	36,713	2,952,806	118,112
August	3,695,632	136,875	3,225,942	124,075	3,562,411	137,016	1,300,199	48,156	2,629,256	97,380
September	3,832,228	153,289			3,561,365	136,976	1,342,092	51,619	2,818,261	108,395
October	4,017,435	148,794			3,580,873	137,726	1,847,139	71,044	3,410,265	131,164
November	3,668,164	141,083	10,062,540	96,755	3,132,891	120,496	1,896,483	72,942	3,430,309	131,935
December	3,586,125	143,445			2,778,714	106,874	1,630,395	62,707	3,300,416	132,017
Total	43,051,022	*138,428	33,694,795	*108,343	40,881,392	*131,030	19,224,084	*61,814	34,568,418	*111,511

	1923		1924		1925		1926		†1927	
	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.
January	3,841,095	142,263	3,649,913	135,182	4,193,281	155,307	4,132,210	158,931	3,759,877	144,611
February	3,471,843	144,660	3,826,246	153,050	3,752,352	156,348	3,785,051	157,710	3,781,376	157,557
March	4,066,680	150,618	4,206,699	161,796	4,194,340	161,321	4,468,617	165,504	4,499,092	166,633
April	3,963,736	158,549	3,348,466	128,787	3,583,676	137,834	4,105,799	157,915	4,094,849	157,494
May	4,216,355	156,161	2,640,034	97,779	3,454,971	132,883	3,927,979	151,076	4,015,192	154,430
June	3,767,256	144,894	2,065,676	82,627	3,204,451	123,248	3,734,153	143,621	3,468,055	133,387
July	3,531,458	141,258	1,877,789	72,223	3,084,472	118,634	3,634,993	139,807	3,178,342	127,134
August	3,695,788	136,881	2,552,891	98,188	3,420,998	131,577	3,986,966	153,345	3,470,903	128,552
September	3,356,776	134,271	2,827,625	108,755	3,489,565	134,214	3,913,383	150,515	3,232,108	124,312
October	3,577,091	132,485	3,125,418	115,756	3,888,814	144,030	4,074,544	156,713	3,289,013	126,500
November	3,134,321	120,551	3,121,149	124,846	3,902,900	156,116	3,705,744	142,529	3,101,764	119,299
December	2,863,266	114,531	3,569,251	137,279	3,970,918	152,728	3,466,766	133,337	‡3,020,000	‡116,000
Total	43,485,665	*139,825	36,811,157	*117,984	44,140,738	*141,932	46,936,205	*150,920	42,910,571	*137,976

*Average. †Beginning with 1927, the Institute excludes crucible and electric ingots which will total approximately 124,000 tons for the year. ‡Estimated.

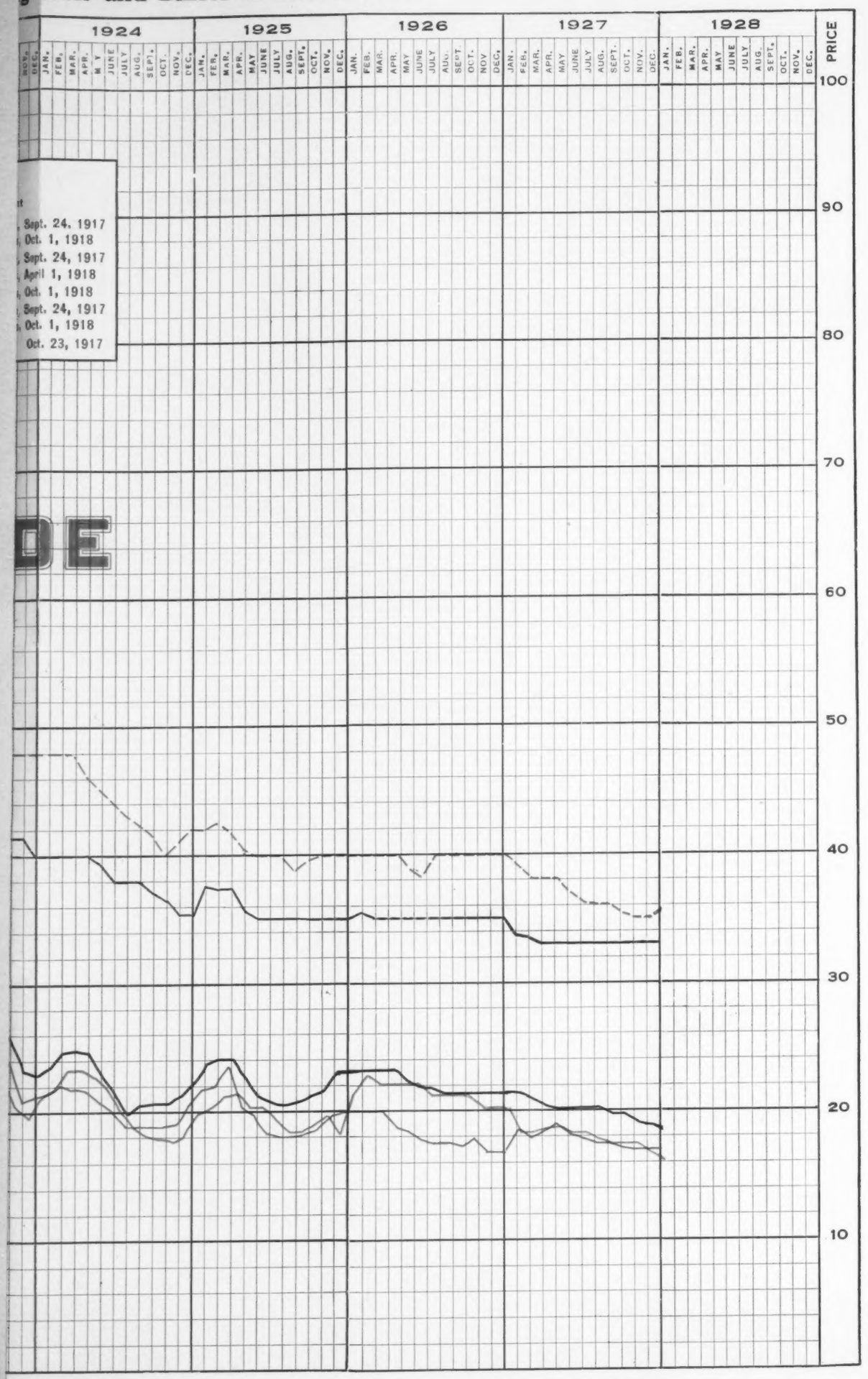
Monthly Iron and Steel Prices For Ten Years, War P

Finished Steel Products in Net Tons, Pig Iron and Billets in Gro



'en Years, War Period Included

g Iron and Billets in Gross Tons



Pig Iron Production

IN GROSS TONS

Annual Statistics of Coke and Anthracite Pig Iron Compiled by American Iron and Steel Institute, Monthly Statistics, 1907 to date, by IRON TRADE REVIEW

1855	396,657	1868	1,100,893	1881	3,573,863	1894	6,434,966
1856	457,738	1869	1,361,153	1882	4,000,193	1895	9,220,967
1857	417,711	1870	1,339,284	1883	4,085,041	1896	8,311,833
1858	374,804	1871	1,363,043	1880	3,670,567	1897	9,397,469
1859	496,952	1872	2,101,760	1885	3,687,522	1898	11,477,184
1860	572,713	1873	2,045,231	1886	5,273,010	1899	13,335,937
1861	478,809	1874	1,886,479	1887	5,900,914	1900	13,404,760
1862	536,609	1875	1,656,777	1888	5,955,105	1901	15,494,913
1863	656,,785	1876	1,593,382	1889	7,028,374	1902	17,481,138
1864	798,342	1877	1,782,805	1890	8,574,558	1903	17,503,568
1865	597,536	1878	2,039,252	1891	7,702,906	1904	16,157,504
1866	918,717	1879	2,151,431	1892	8,619,379	1905	22,639,452
1867	997,576	1880	3,855,228	1893	6,737,713	1906	24,874,184

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1907	
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	*69,177

	—Stacks— No.	In	——Output—— Total	Av. daily
			1908	
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	*42,947

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1909	
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	*69,383

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1910	
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	*73,550

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1911	
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	*63,558

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1912	
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	*80,124

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1913	
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	*83,980

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1914	
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	*62,934

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1915	
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	*81,022

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1916	
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	*106,609

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1917	
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	*104,561

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1918	
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	438	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	*105,308

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1919	
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	*83,777

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1920	
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	*99,456

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1921	
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	*45,223

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1922	
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	*73,563

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1923	
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,546,308	118,210
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,642	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	*109,659

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1924	
January	414	248	3,015,480	97,273
February	414	263	3,073,619	105,987
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,783,457	57,531
August	411	150	1,882,986	60,741
September	411	174	2,053,617	68,454
October	411	182	2,461,727	79,410
November	411	204	2,514,979	83,832
December	411	229	2,956,389	95,367
Total			31,076,572	*84,908

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1925	
January	411	251	3,372,207	108,781
February	411	256	3,214,067	114,788
March	410	246	3,571,422	115,207
April	409	221	3,211,235	107,041
May	405	196	2,933,907	94,642
June	399	191	2,679,045	89,301
July	396	188	2,665,262	85,976
August	391	192	2,707,171	87,328
September	387	200	2,725,885	90,862
October	386	209	3,017,889	97,351
November	385	220	3,023,257	100,775
December	385	234	3,249,057	104,808
Total			36,370,404	*99,645

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1926	
January	385	225	3,319,789	107,089
February	382	228	2,923,850	104,423
March	377	235	3,458,171	111,554
April	376	237	3,438,805	114,627
May	376	229	3,477,820	112,187
June	372	220	3,232,478	107,749
July	372	217	3,224,663	104,021
August	372	215	3,200,723	103,240
September	372	216	3,163,269	105,442
October	374	218	3,334,206	107,555
November	375	216	3,237,992	107,933
December	369	203	3,089,175	99,651
Total			39,100,941	*107,126

	—Stacks— No.	In	——Output—— Total	Av. Daily
			1927	
January	369	210	3,101,346	100,043
February	369	218	2,940,604	105,021
March	365	223	3,482,107	112,326
April	364	221	3,424,377	114,146
May	363	211	3,391,067	109,388
June	362	198	3,089,726	102,991
July	362	190	2,954,625	95,311
August	362	189	2,950,674	95,183
September	362	181	2,782,500	92,750
October	361	174	2,812,045	90,712
November	359	171	2,661,863	88,728
December	figures, Page 71.			
Total	.....	.....	.....	.....

*Average

Prices Tell Market History

Ores and Alloys

Per Gross Ton

Spiegeleisen, 1915-1927

At Producers' Furnaces

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$37.00	$37.00	$37.00	$37.00	$35.50	$34.80	$34.00	$33.35	$33.00	$30.15	$30.00	$31.00
1926.....	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	38.75	37.00
1925.....	32.00	33.00	33.00	33.00	33.00	32.00	31.50	32.25	33.00	33.00	34.00	34.00
1924.....	39.00	39.00	38.00	36.00	36.75	36.00	35.00	32.50	32.00	31.00	31.75	31.00
1923.....	34.90	35.75	37.25	39.25	43.00	46.00	45.00	45.00	43.50	40.00	39.00	38.00
1922.....	25.50	28.00	28.00	30.00	35.00	35.25	35.00	37.00	38.00	37.75	36.80	35.50
1921.....	46.25	37.75	34.20	32.00	31.75	29.60	27.50	26.20	25.25	24.85	25.00	25.00
1920.....	46.60	57.60	60.40	66.85	75.00	75.00	75.00	79.35	82.00	80.00	74.35	57.90
1919.....	*67.50	*52.50	*42.50	*34.50	*31.35	*27.50	34.00	34.00	34.00	34.00	34.00	39.00
1918.....	59.00	59.00	65.50	*70.00	*71.00	*75.00	*75.00	*75.00	*75.00	*75.00	*75.00	*72.50
1917.....	57.50	66.25	77.50	76.75	78.00	83.00	85.00	81.25	80.50	73.50	63.25	60 00
1916.....	32.50	42.50	55.00	60.00	60.00	55.00	47.50	47.50	45.00	40.00	45.00	50.00
1915.....	25.00	25.50	26.00	26.00	26.00	26.00	26.00	26.00	29.00	30.00	30.00	30.00

*Prices from and including April, 1918, and to and including June, 1919, are for 16 per cent spiegeleisen. All other prices apply to 20 per cent metal.

Ferrosilicon, 10 Per Cent 1916-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$33.50	$32.00	$30.00
1926.....	35.00	35.50	36.00	34.40	33.00	33.00	33.00	33.00	33.00	33.25	24.00	34.00
1925.....	39.50	39.50	39.50	37.50	35.50	35.50	35.50	35.50	34.00	33.50	34.25	35.00
1924.....	41.50	42.50	42.25	41.50	40.30	39.50	39.50	39.50	39.50	39.50	39.50	39.50
1923.....	44.50	45.50	47.10	48.50	48.50	48.00	46.50	43.50	43.50	43.50	41.50	41.50
1922.....	38.50	37.50	36.50	37.25	40.50	41.50	41.50	42.50	48.50	50.00	48.00	44.50
1921.....	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	52.50	57.50
1920.....	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50
1919.....	54.00	54.00	52.95	47.40	45.00	47.40	49.75	49.75	49.75	49.75	54.75	58.50
1918.....	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	57.00	57.00	57.00
1917.....	42.00	42.00	49.80	57.00	67.00	82.50	92.25	95.00	95.00	95.00	55.00	55.00
1916.....	28.00	28.00	31.00	31.00	32.00	32.00	32.00	31.80	30.25	30.50	34.60	42.00

Ferrosilicon, 50 Per Cent 1916-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00
1926.....	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
1925.....	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
1924.....	75.00	75.00	75.00	75.00	75.00	75.00	74.50	74.50	74.50	75.00	75.00	82.50
1923.....	85.00	90.00	92.50	95.00	95.00	87.50	82.50	82.50	82.50	82.50	80 00	75.00
1922.....	57.50	55.00	54.00	55.00	57.50	57.50	55.00	55.00	55.00	70.00	82.50	82.50
1921.....	80.00	92.00	93.00	90.00	80.00	75.00	75.00	65.00	65.00	60.00	60.00	57.00
1920.....	82.00	80.00	83.00	80.00	83.00	82.50	82.50	80.00	82.50	82.50	80 00	80 00
1919.....	145.00	125.00	115.00	110.00	100.00	85.00	80.00	78.00	80.00	85.00	80.00	80.00
1918.....	175.00	175.00	177.50	172.50	170 00	170.00	165.00	153.50	150.00	151.00	150.00	150.00
1917.....	122.50	156.25	175.00	187.50	230.00	230.00	237.50	225.00	212.50	171.25	157.50	172.50
1916.....	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	94.25	95.00	95.00

Ferrochrome, 4-6 Per Cent 1918-1927

Per Pound of Metallic Chromium Contained

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50	$11.50
1926.....	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50
1925.....	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11 50	11.50	11.50
1924.....	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75
1923.....	12.50	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
1922.....	14.50	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	13.00	13.50	13.50
1921.....	17.50	17.25	17.25	16.25	16.00	15.00	15.00	14.00	14.50	14.50	14.50	14.50
1920.....	22.50	19.50	19.50	19.50	18.50	18.50	21.50	20.00	18.50	18.50	18.50	18.50
1919.....	41.00	32.50	31.00	31.00	32.00	32.00	32.00	32.00	29.00	29.00	28.00	28.00
1918.....	.....	.....	.....	.....	.....	.....	44.00	41.00	41.00	41.00	41.00	41.00

Ferromanganese, Delivered, Pittsburgh, 1914-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$104.79	$104.79	$104.79	$104.79	$98.54	$94.79	$94.79	$94.79	$94.79	$94.79	$94.79	$104.79
1926.....	119.79	119.79	102.29	92.79	92.79	92.79	92.79	92.79	92.79	99.79	104.79	104.79
1925.....	116.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79
1924.....	113.79	112.29	112.29	112.29	112.29	112.79	110.79	98.79	97.79	104.79	107.29	109.79
1923.....	109.79	112.29	120.79	124.79	129.79	129.79	122.29	122.29	114.79	112.79	113.79	113.79
1922.....	61.90	65.32	67.82	69.07	72.32	72.82	72.29	72.29	†80.59	105.47	104.92	104.92
1921.....	101.00	96.85	89.00	87.50	83.00	76.50	75.00	70.75	64.75	61.65	60.00	60 00
1920.....	146.00	160.00	172.00	200.00	200.00	198.00	190.00	193.75	172.40	156.40	153.00	120 00
1919.....	*212.50	165.00	134.00	113.75	110.00	111.75	111.00	110.00	105.00	110.00	110.00	121.00
1918.....	250.00	250.00	250.00	250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*250 00	*250.00	*236.00
1917.....	175.00	192.50	212.50	250.00	375.00	400.00	400.00	387.50	380.00	300.00	247.50	242.50
**1916....	139.88	215.13	334.75	412.50	347.75	244.88	198.75	173.18	167.67	160.00	155.00	162.50
1915.....	68.00	78.80	95.00	95.00	97.00	105.00	103.57	101.36	110.00	109.64	100.42	103.04
1914.....	43.57	39.01	39.02	38.68	38.16	38.00	37.54	102.08	93.45	70.80	67.85	68.00

*Prices from May, 1918, to January, 1919, inclusive, were based on 70 per cent ferromanganese. All other prices in above table were based on 80 per cent metal.

†Duty of 1¾ cents per pound contained manganese became effective on ferromanganese Sept. 21.

**Quotations seaboard to Jan., 1917, delivered Pittsburgh thereafter.

Market History —

Ferrotungsten, 1918-1927

Per Pound of Metallic Tungsten Contained

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$1.05	$1.05	$1.01	$1.00	$0.98	$0.98	$0.96	$0.94	$0.92	$0.92	$0.92	$0.95
1926	1.14	1.14	1.14	1.09	1.08	1.00	1.00	1.00	1.00	1.00	1.05	1.05
1925	0.86	0.88	0.93	1.02	1.00	1.01	1.07	1.07	1.10	1.11	1.12	1.15
1924	0.87	0.86	0.88	0.90	0.91	0.90	0.89	0.87	0.87	0.87	0.87	0.87
1923	0.87	0.87	0.89	0.90	0.92	0.92	0.95	0.88	0.87	0.87	0.87	0.87
1922	0.42	0.37	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.85	0.92	0.92
1921	0.65	0.57	0.57	0.47	0.47	0.50	0.50	0.47	0.36	0.36	0.36	0.36
1920	1.05	1.05	1.00	1.00	1.05	1.07	1.12	1.10	1.10	0.95	0.95	0.95
1919	2.35	2.15	2.07	1.75	1.40	1.32	1.30	1.22	1.25	1.25	1.20	1.15
1918	1.95	2.72	1.98	2.32	2.26	2.23	2.25	2.32	2.32	2.55	2.65	2.45

Manganese Ore, 1915-1927

Dollars Per Gross Ton, Duty Paid, North Atlantic Ports, on Basis of 50 Per Cent Ore

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70	$30.70
1926	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70
1925	32.20	32.70	33.20	33.20	32.70	32.20	32.20	32.20	31.70	31.70	31.70	31.70
1924	31.20	32.70	23.20	32.20	32.20	31.70	30.70	30.20	30.20	30.20	31.70	32.20
1923	29.45	29.45	31.70	33.20	32.70	32.95	32.95	32.95	31.70	31.70	31.70	31.70
1922	10.50	11.00	12.50	12.75	12.75	13.25	13.50	13.75	*14.35	25.50	25.50	25.50
1921	18.75	17.50	17.25	14.00	14.00	12.50	12.50	12.50	12.50	12.50	12.50	12.00
1920	30.00	38.75	38.75	32.25	35.00	37.50	42.25	35.00	35.00	32.75	25.00	21.25
1919	55.50	38.75	37.50	30.00	30.00	30.00	31.25	31.25	30.00	27.50	27.50	27.50
1918	63.75	63.75	60.00	65.00	65.00	65.00	68.50	65.00	65.00	65.00	62.50	55.00
1917	30.00	30.00	40.00	40.00	50.00	50.00	50.00	50.00	60.00	60.00	60.00	60.00
1916	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	30.00	30.00	30.00	30.00
1915	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	22.50	22.50	22.50	22.50

*After Sept., 1922, duty 1c per pound metallic content, $11.20 per gross ton 50 per cent ore.

Pig Iron

Per Gross Ton

Basic, Valley, 1902-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$18.50	$17.85	$18.50	$19.00	$18.10	$17.90	$17.50	$17.50	$17.15	$17.00	$17.00	$17.00
1926	20.00	19.50	21.00	19.80	19.25	19.00	18.70	18.00	18.20	19.10	19.25	19.75
1925	21.90	22.00	21.40	20.20	19.90	18.20	18.00	18.00	18.30	18.80	19.90	20.00
1924	21.40	22.00	21.70	21.70	20.70	20.00	19.00	19.00	19.00	19.00	19.25	20.50
1923	25.90	26.10	29.80	31.00	29.80	27.35	25.15	25.00	25.00	23.75	20.80	21.00
1922	18.30	17.95	17.95	20.20	24.65	25.00	25.00	27.40	32.90	30.50	28.10	25.20
1921	29.35	17.15	24.80	23.95	22.05	21.35	19.00	19.00	19.70	19.30	19.10	18.05
1920	38.20	42.25	43.00	43.00	43.25	43.65	45.75	48.00	48.50	45.25	34.90	33.00
1919	30.00	30.00	28.95	25.75	25.75	25.75	25.75	25.75	25.75	25.75	30.15	34.20
1918	33.00	33.00	33.00	32.00	32.00	32.00	32.00	32.00	32.00	33.00	33.00	33.00
1917	30.00	30.00	32.55	38.00	41.90	49.15	52.85	49.40	41.35	33.00	33.00	33.00
1916	17.85	18.00	18.25	18.00	18.15	18.00	18.00	18.00	18.65	20.30	27.25	30.00
1915	12.50	12.50	12.50	12.50	12.65	12.70	12.95	14.35	15.00	15.00	15.50	17.50
1914	12.35	13.05	13.05	13.00	13.00	13.00	13.00	13.00	13.00	12.85	12.50	12.50
1913	16.45	16.30	16.05	15.70	14.90	14.50	14.20	14.05	14.15	13.70	13.00	12.50
1912	12.40	12.25	12.75	13.00	13.00	13.20	13.50	14.00	15.15	16.20	16.20	16.45
1911	13.30	13.60	13.75	13.75	13.40	13.05	13.00	13.00	12.70	12.50	12.30	12.45
1910	16.90	16.30	16.00	15.95	15.05	14.70	14.50	14.00	13.85	13.15	13.35	13.45
1909	15.50	15.20	14.95	14.15	14.15	14.95	15.00	15.25	15.90	16.95	17.50	17.00
1908	17.10	17.00	16.00	16.00	14.85	15.25	14.50	14.60	14.25	14.25	14.95	15.50
1907	22.00	22.00	21.00	21.00	23.00	22.25	21.95	21.45	20.10	19.70	18.75	18.00
1906	17.00	16.70	17.00	17.15	17.25	17.50	17.25	17.75	18.40	19.30	21.00	23.00
1905	15.25	15.25	15.50	15.00	15.00	14.35	14.25	14.50	14.70	15.00	16.75	16.50
1904	12.85	12.50	12.90	13.10	12.50	11.65	11.35	11.75	11.65	12.05	13.95	19.65
1903	20.95	21.25	21.10	20.60	19.35	19.15	18.55	15.35	16.00	15.10	14.15	13.10
1902	19.75	16.15	16.50	17.50	15.75	20.65	20.60	20.60	20.65	20.70	20.90	20.90

Bessemer, Delivered, Pittsburgh, 1895-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$21.26	$20.76	$21.16	$21.26	$20.86	$20.66	$20.26	$20.26	$19.86	$19.76	$19.76	$19.26
1926	22.76	22.76	22.76	21.56	21.01	20.76	20.46	19.76	19.96	20.86	22.01	21.51
1925	24.66	24.66	23.96	26.76	21.66	20.76	20.76	20.76	21.06	21.56	22.66	22.76
1924	24.66	25.01	24.86	24.61	24.06	23.26	21.66	21.76	21.76	21.76	22.11	23.26
1923	29.27	29.57	31.67	32.77	32.07	30.27	28.52	28.07	28.27	27.27	25.47	24.27
1922	21.51	21.31	21.21	22.46	26.46	26.96	26.76	29.16	35.27	35.12	27.77	30.33
1921	33.96	30.96	28.96	27.46	26.06	25.06	22.96	21.96	22.46	22.06	21.96	21.96
1920	40.00	43.15	43.40	43.50	43.90	44.25	46.80	49.50	50.45	50.17	42.33	36.96
1919	33.60	33.60	32.55	29.35	29.35	29.35	29.35	29.35	29.35	29.35	32.00	36.65
1918	37.25	37.25	37.25	36.15	36.15	36.40	36.60	36.60	36.60	36.60	36.60	36.60
1917	35.95	35.95	37.45	42.20	44.95	55.20	57.95	55.55	48.27	37.25	37.25	37.25
1916	21.32	21.45	21.55	21.95	21.95	21.95	21.95	21.95	22.20	24.33	30.35	35.95
1915	14.70	14.63	14.55	14.55	14.55	14.58	14.88	15.89	16.80	16.95	17.45	19.70
1914	15.00	15.09	15.15	14.90	14.90	14.90	14.90	14.90	14.90	14.85	14.70	14.70
1913	18.15	18.15	18.15	17.90	17.90	17.26	16.65	16.52	16.65	16.60	16.09	15.90
1912	15.15	15.00	15.02	15.15	15.15	15.15	15.15	15.43	15.93	17.75	18.05	18.15
1911	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.39	15.10	15.15
1910	19.90	19.42	18.90	18.15	17.09	16.73	16.40	16.21	15.90	15.90	15.90	15.90
1909	17.34	16.78	16.34	15.80	15.48	16.13	16.37	17.13	18.33	19.68	19.80	19.90
1908	19.00	17.90	17.86	17.49	16.92	16.90	16.73	16.11	15.90	15.48	16.74	17.40
1907	22.92	22.78	22.85	22.16	24.10	24.10	23.30	22.90	22.90	22.80	20.60	19.90
1906	17.32	17.29	17.26	17.25	17.24	17.38	17.57	17.96	18.44	20.06	21.96	22.75
1905	16.85	16.45	16.35	16.30	16.20	15.65	15.00	15.40	15.90	16.50	17.70	18.10
1904	13.60	13.35	13.85	14.10	13.60	12.60	12.50	12.65	12.75	13.35	15.25	16.60
1903	22.35	22.35	22.00	21.60	20.00	19.85	19.00	17.85	16.35	15.85	15.25	14.35
1902	16.70	16.93	17.56	18.37	20.95	21.25	22.00	21.75	21.75	21.95	22.25	22.12
1901	13.25	13.60	16.56	16.69	16.65	15.94	16.00	15.90	15.71	15.90	16.10	16.35
1900	24.90	24.90	24.90	24.90	24.90	19.75	18.00	16.05	14.00	13.25	13.65	13.55
1899	11.00	11.75	14.00	15.15	16.25	19.00	20.75	22.00	23.50	24.00	24.50	25.00
1898	9.90	10.15	10.40	10.50	10.50	10.40	10.35	10.40	10.40	10.30	10.20	10.65
1897	10.50	10.65	10.50	10.00	9.35	9.35	9.00	9.05	10.00	10.25	10.25	9.90
1896	12.30	12.80	12.00	13.15	12.75	12.40	12.20	11.45	11.25	11.50	12.30	11.40
1895	10.00	10.15	10.25	10.75	11.25	12.00	14.00	14.75	17.25	15.75	14.00	12.25

Market History —

Malleable, f.o.b. Valley, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$18.50	$18.10	$18.40	$18.50	$18.50	$18.25	$17.50	$17.50	$17.50	$17.50	$17.50	$17.25
1926.....	20.50	20.50	20.50	19.30	19.00	18.00	17.80	17.50	17.70	18.35	19.75	19.00
1925.....	22.75	22.25	21.25	20.10	19.00	18.50	18.50	18.50	18.80	19.35	20.35	20.50
1924.....	22.00	23.00	22.50	22.20	21.30	19.75	19.00	19.00	19.50	19.50	19.75	20.50
1923.....	27.25	27.25	29.20	31.00	30.20	28.25	25.50	24.70	24.60	23.25	20.40	22.00
1922.....	19.45	19.00	19.00	20.40	24.60	24.50	25.00	28.60	34.00	32.30	29.25	26.25
1921.....	32.25	28.75	26.40	24.90	23.75	22.60	20.40	20.00	20.40	20.20	20.00	20.00
1920.....	38.95	41.60	42.35	41.60	41.60	41.85	43.40	48.25	50.50	48.25	40.40	36.00
1919.....	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27 25	27.75	31.75	36.40
1918.....	33.50	33.50	34.45	34.45	34.45	34.65	34.90	34.90	34 90	34.50	34.50	34.50
1917.....	31.00	33.50	36.00	39.00	42.70	50.10	53.00	54.00	49.60	34.25	33.50	33.50
1916.....	19.00	18.65	18.50	18.50	18.50	18.50	18.50	18.50	18.55	20.15	25.85	30.75
1915.....	12.75	12.75	12.85	12.50	12.50	12.50	12.65	13.75	14.50	14.60	15.50	17.90
1914.....	13.15	13.19	14.15	13.25	13.25	13.00	13.00	13.00	13.00	12.90	12.75	12.75
1913.....	17.25	17.20	16.75	15.75	14.85	14.40	14.15	14.00	14.05	14.25	13.85	13.50

No. 2 Foundry, f.o.b. Valley, 1904-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$18.43	$18.06	$18.37	$18.50	$18.50	$18.20	$17.50	$17.50	$17.50	$17.50	$17.45	$17.25
1926.....	20.50	20.50	20.50	19.30	19.00	18.00	17.80	17.50	17.70	18.35	19.60	19.00
1925.....	22.25	22.00	21.25	20.20	18.85	18.50	18.50	18.75	19.20	20.40	00.00	20.50
1924.....	22.40	23.00	22.50	21.75	20.90	19.50	19.00	19.25	19.50	19.50	19.60	20.50
1923.....	27.00	27.00	29.60	31.00	30.15	27.75	25.60	24.70	24.75	23.40	22.00	22.00
1922.....	20.05	19.20	19.20	20.55	23.95	24.20	24.20	31.00	35.25	31.85	28.40	25.00
1921.....	31.10	28.20	26.20	25.05	23.80	22.50	20.30	20.10	21.20	21.20	20.05	20.35
1920.....	40.90	42.40	43.40	44.20	45.40	45.40	46.40	49.65	50.95	48.95	42.95	37.20
1919.....	31.00	31.00	29.10	26.75	26.75	28.15	28.15	28.15	29.50	34.95	33.35	38.15
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	32.35	34.25	37.20	39.90	42.95	51.40	55.90	54.70	49.05	33.00	33.00	33.00
1916.....	18.90	18.75	18.75	18.90	18.70	18.50	18.50	18.50	18.65	20.75	26.10	31.30
1915.....	13.25	13.25	13.25	12.95	12.75	12.75	12.85	13.95	14.75	14.85	15.90	17.50
1914.....	12.89	13.25	13.40	13.50	13.50	13.50	13.50	13.30	13.25	13.10	12.90	13.05
1913.....	17.50	17.30	16.75	15.80	14.80	14.15	13.85	13.80	14.00	13.90	13.90	13.50
1912.....	13.00	13.10	13.20	13.35	13.30	13.30	13.50	13.85	14.50	16.15	17.30	17.50
1911.....	13.75	13.75	13.85	13.85	14.75	13.60	13.50	13.50	13.50	13.50	13.15	12.80
1910.....	17.00	16.55	16.10	15.75	15.35	14.65	14.20	14.10	14.40	13.95	13.75	13.75
1909.....	15.35	15.00	14.85	14.25	14.35	14.85	15.25	15.35	16.25	17.10	17.25	17.25
1908.....	16.35	16.00	15.70	15.10	14.50	15.35	15.10	15.00	14.60	14.20	15.50	15.50
1907.....	23.30	24.00	24.00	24.00	24.50	24.50	23.15	22.55	21.30	20.05	19.15	17.05
1906.....	17.55	17.25	17.15	16.75	16.65	16.25	16.50	18.00	19.00	20.50	23.00	23.75
1905.....	16.50	16.15	16.00	16.15	15.75	14.35	14.35	14.55	14.75	15.65	16.85	17.25
1904.....	12.50	12.25	13.00	12.90	12.15	11.65	11.50	11.65	11.75	12.40	15.00	16.00

No. 2 Foundry, f.o.b. Chicago, 1895-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$20.90	$20.25	$20.00	$20.00	$20.00	$20.00	$20.00	$19.50	$19.50	$18.75	$18.50	$18.50
1926.....	23.00	23.00	23.00	22.00	21.65	21.10	21.00	21.00	21.00	21.00	21.00	21.00
1925.....	23.80	24.00	24.00	22.60	21.25	20.25	20.30	20.50	21.10	21.60	22 75	23.00
1924.....	23.70	24.40	24.50	24.40	22.80	21.40	19 80	20.40	20.50	20.50	21.00	22 00
1923.....	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922.....	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.00
1921.....	32.75	28.65	25.80	24.25	23.00	21.10	19.15	19.60	21.75	21.50	21.00	20.00
1920.....	40.00	42.25	43.00	43.00	43.00	43.00	44.40	46.00	46.00	46.00	42.40	36.50
1919.....	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	31.75	31.75	38.30
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	30.00	31.25	35.70	39.25	43.20	51.00	55.00	55.00	49.50	33.00	33.00	33.00
1916.....	18.50	18.50	18.70	19.00	19.00	19.00	19.00	19.00	18.65	19.15	25.00	29.25
1915.....	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	13.80	14.45	17.10	18.00
1914.....	14.25	14.20	14.25	14.25	14.25	14.20	14.00	14.00	13.65	13.30	13.00	13.00
1913.....	18.00	18.00	17.60	17.25	16.70	16.10	15.20	15.00	15.00	15.00	15.00	14.50
1912.....	14.00	14.00	14.00	14.25	14.50	14.50	14.60	15.30	16.35	17.30	17.85	18.00
1911.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.50	14.50	14.50	14.00	14.00
1910.....	19.00	18.75	18.25	17.00	16.75	16.50	16.50	16.50	16.50	16.00	16 00	16.00
1909.....	17.45	16.75	16.50	16.45	16.20	16.40	16.90	17.35	18.20	18.85	19.00	19.00
1908.....	18.25	17.85	17.40	17.20	17.00	17.30	17.00	17.00	16.75	16.50	16.75	17.35
1907.....	26.00	26.50	26.75	27.50	27.40	26.50	25.40	24.50	23.60	22.60	20.60	19.00
1906.....	19.25	19.25	19.00	18.75	18.50	18.10	18.30	18.90	19.75	21.50	26.50	27.00
1905.....	17.50	17.50	17.50	17.50	17.25	16.60	16.15	16.35	16.50	17.55	18.90	19.50
1904.....	14.10	13.75	13.55	14.00	13.80	13.40	13.30	13.35	13.40	13.70	15.60	16.60
1903.....	25.00	24.00	24.00	23.00	21.70	20.50	18.50	17.50	16.85	15.90	14.50	14.30
1902.....	15.80	16.75	18.60	19.75	21.75	22.50	23.40	24.65	27.15	27.15	26.90	25.40
1901.....	14.60	14.10	15.20	15.50	15.50	15.50	15.50	15.20	15.00	15.00	15.00	15.50
1900.....	24.50	24.50	23.75	23.25	22.00	20.25	17.75	15.50	14.50	14.00	14.25	14 60
1899.....	11.25	12.00	14.25	15.00	15.25	17.00	17.00	20.00	22.00	23.00	23.50	24.50
1898.....	10.50	10.50	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11 00	11.00	11.00
1897.....	11.00	10.75	10.75	10.75	10.25	10.00	10.00	10 00	10.25	10.75	10.75	10.50
1896.....	13.50	12.25	12.00	12.00	11.75	11.25	11.25	11.20	10.80	10.75	11.10	11.25
1895.....	9.75	9.75	9.75	10.00	10.25	10.75	12.50	13.50	13.50	14.50	14.50	14.00

Southern No. 2, f.o.b. Birmingham, 1904-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$18.50	$18.00	$18.00	$18.00	$18.00	$18.00	$17.43	$17.25	$17.25	$17.25	$16.00	$16.00
1926.....	22.75	22 00	22.00	22.00	22.00	21.00	21.00	21.00	20.80	20.00	20.00	20 00
1925.....	20.10	20.75	21.00	20.00	20.00	19.00	18.00	18.00	18.50	19.50	21.00	21.20
1924.....	21.60	23.00	23.00	22.20	21.60	20.00	18.20	17.90	17.65	17.50	17.90	19.50
1923.....	23.30	24.50	26.50	27.00	27.00	26.75	25.00	23.60	22.75	20.20	19.25	21.00
1922.....	16.15	19.25	15.25	16.00	17.60	18.50	18.50	20.70	26.25	27.40	24.00	22.50
1921.....	33.75	27.70	25.10	23.00	22.50	21.70	20.25	19.00	19.00	19.00	18.25	17.00
1920.....	38.20	40.00	40.00	40.00	42.00	42.30	42.30	42.00	42.00	42.00	39.50	38.00
1919.....	31.00	31.00	30.00	26.75	26.25	25.25	25.00	26.75	26.75	27.45	30.65	35.15
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	35.25	35.25	35.25
1917.....	23.00	24.50	28.00	35.80	35.75	35.75	46.00	48.00	43.50	33.50	33.50	33.50
1916.....	14.50	14.65	15.00	15.00	15.00	14.45	14.00	13.60	14.40	15.15	19.60	23.00
1915.....	9.50	9.50	9.40	9.35	9.75	9.55	9.60	11.00	11.30	11.75	13.15	14.20
1914.....	10.50	10.50	10.60	10.50	10.50	10.45	10.05	10.00	10.00	10.00	9.90	9.50
1913.....	13.70	13.50	13.00	12.50	11.75	10.60	10.50	11.00	11.00	11.00	10.75	11.00
1912.....	10.00	10.00	10.05	10.50	10.95	11.00	11 25	11.65	12.50	13.45	13.75	13.50
1911.....	11.00	11.00	11.00	11.00	10.75	10.25	10.00	10.05	10.10	10.00	9.75	10.00
1910.....	14.00	13.90	13.00	12.10	11.80	11.60	11.40	11.00	11.00	11.00	11.00	11.00
1909.....	13.00	12.70	11.75	11.00	11.00	11.30	12.30	13.00	14.00	14.50	14.50	14.00
1908.....	12.80	12.50	12.10	11.90	11.50	12.00	11.60	12.05	12.50	12.50	12.50	13.00
1907.....	23.00	23.00	22.75	22.00	21.40	21.25	20.50	19.80	18.10	17.65	16.00	14.90
1906.....	14.00	14.00	13.70	13.65	13.75	13.50	13.00	14.15	16.00	17.15	21.25	22.00
1905.....	13.50	13.50	13.50	13.25	12.75	11.85	11.00	11.65	11.75	12.50	14.00	14.00
1904.....	9.75	9.50	9.70	10.00	9.65	9.15	9.15	9.50	9.50	10.65	12.75	13.05

Market History —

Malleable, f.o.b. Chicago, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$20.90	$20.25	$20.00	$20.00	$20.00	$20.00	$20.00	$19.50	$19.50	$18.75	$18.50	$18.50
1926.....	23.00	23.00	23.00	22.00	21.65	21.10	21.00	21.00	21.00	21.00	21.00	21.00
1925.....	24.00	24.00	24.00	22.70	21.25	20.25	20.50	20.50	21.10	21.60	22.75	23.00
1924.....	23.70	24.40	24.50	24.40	22.80	21.40	19.80	20.40	20.50	20.50	21.00	22.00
1923.....	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922.....	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.25
1921.....	33.25	29.00	26.25	24.75	23.50	21.20	19.15	19.40	21.75	21.20	21.00	20.00
1920.....	40.50	42.75	43.50	43.50	43.50	43.50	44.90	46.50	46.50	46.50	43.00	37.50
1919.....	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27.25	28.00	32.25	38.80
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	34.50	34.50	34.50
1917.....	30.00	31.25	35.80	39.00	43.20	50.50	55.00	55.00	49.50	33.35	33.50	33.50
1916.....	19.00	19.00	19.00	19.50	19.50	19.50	19.50	19.50	19.15	19.50	25.00	29.25
1915.....	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	14.20	15.10	17.40	18.00
1914.....	14.25	14.25	14.25	14.25	14.25	14.25	14.00	14.00	13.50	13.50	13.00	13.00
1913.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.40

No. 2X Foundry, Delivered, Philadelphia, 1910-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$22.76	$22.26	$22.26	$22.26	$22.26	$22.01	$21.51	$21.26	$21.01	$20.66	$20.51	$20.26
1926.....	24.26	24.01	23.26	23.26	23.01	22.76	22.26	22.01	22.26	22.51	23.51	23.76
1925.....	25.61	25.26	24.51	23.16	21.76	21.51	21.26	21.76	21.86	22.61	24.01	24.26
1924.....	24.26	24.26	24.13	23.73	22.60	21.76	21.76	21.76	21.26	21.36	22.98	24.88
1923.....	29.56	30.10	32.00	32.75	32.75	30.60	28.00	25.80	26.20	24.50	23.00	24.26
1922.....	21.55	21.35	23.60	23.75	25.60	27.20	27.50	32.15	34.25	33.00	30.50	28.45
1921.....	35.00	31.00	27.40	26.25	26.10	26.00	23.50	21.00	21.40	22.00	22.50	22.10
1920.....	43.90	45.00	45.68	46.80	46.90	46.90	48.55	50.95	53.75	52.65	46.75	38.95
1919.....	36.15	36.15	35.10	31.00	30.10	29.60	29.50	29.60	29.95	32.00	35.85	40.75
1918.....	34.25	34.25	34.25	34.25	34.25	34.25	34.50	34.50	34.50	38.85	39.15	39.15
1917.....	30.50	31.75	36.50	41.75	43.35	47.50	54.35	53.40	47.80	34.00	34.00	34.00
1916.....	19.75	20.00	20.00	20.75	20.50	19.75	19.75	19.75	19.75	20.50	25.25	30.00
1915.....	14.25	14.25	14.25	14.25	14.00	14.25	14.50	15.25	16.25	16.50	17.50	19.25
1914.....	14.75	15.00	15.00	15.00	14.75	14.75	14.75	14.75	14.75	14.50	14.25	14.25
1913.....	18.25	18.00	17.75	17.50	17.00	16.25	15.50	15.75	16.00	15.75	15.50	15.00
1912.....	15.00	15.00	15.00	15.25	15.25	15.50	15.75	16.00	16.50	17.50	18.00	18.25
1911.....	15.50	15.50	15.75	15.50	15.25	15.00	15.00	15.00	15.00	15.00	14.85	14.75
1910.....	19.00	18.40	18.25	17.75	17.25	16.75	16.00	16.00	16.00	15.75	15.50	15.50

Basic, Delivered, Eastern Pennsylvania, 1909-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$21.25	$21.00	$21.00	$20.90	$20.75	$20.75	$20.50	$19.75	$19.75	$19.50	$19.50	$19.25
1926.....	22.75	22.50	22.20	21.76	21.76	21.76	21.00	21.00	20.76	21.00	22.50	22.75
1925.....	24.25	24.20	24.05	22.65	21.45	21.50	21.50	20.55	20.50	20.50	22.70	23.00
1924.....	22.50	22.50	21.50	21.35	20.75	20.60	20.50	20.00	20.00	20.00	21.46	22.50
1923.....	27.70	28.15	29.35	30.75	30.75	28.15	27.25	25.10	25.10	24.00	22.60	23.30
1922.....	20.25	19.85	19.90	21.70	24.55	25.25	26.00	29.50	30.00	30.25	28.00	27.65
1921.....	33.35	29.95	26.20	25.00	25.00	24.70	22.25	20.70	19.50	20.50	20.90	20.25
1920.....	39.75	40.50	43.00	43.70	44.00	44.05	44.10	47.45	51.15	50.75	44.55	34.75
1919.....	33.90	33.90	32.85	29.65	28.80	25.50	26.60	27.00	27.00	27.90	33.00	35.75
1918.....	33.90	33.90	33.90	32.90	32.90	32.90	32.50	32.50	32.90	36.60	36.90	36.90
1917.....	30.15	30.50	33.80	38.25	40.80	46.40	50.75	51.00	46.50	33.50	33.50	33.50
1916.....	19.50	19.50	20.00	20.50	20.00	19.25	19.00	19.25	20.00	21.00	25.50	30.50
1915.....	13.50	13.75	14.00	13.25	13.50	13.50	13.75	15.25	17.25	17.50	17.75	18.00
1914.....	14.00	14.25	14.25	14.25	14.00	14.00	14.00	14.00	14.00	14.00	13.50	13.50
1913.....	18.25	18.00	17.50	16.50	16.50	16.00	15.25	15.00	15.25	15.25	15.00	14.25
1912.....	14.25	14.25	14.25	15.00	15.00	15.25	15.50	16.25	16.50	17.50	18.00	18.25
1911.....	14.50	15.00	15.25	15.25	14.75	14.50	14.50	14.50	14.50	14.50	14.25	14.25
1910.....	18.75	18.50	18.00	17.50	16.25	15.75	15.50	15.00	15.00	14.50	14.50	14.50
1909.....	16.40	16.10	15.85	15.05	15.00	15.85	15.90	16.15	16.80	17.85	18.36	18.15

Southern Ohio No. 2, f.o.b. Ironton, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$19.90	$20.00	$20.00	$20.00	$20.00	$19.80	$19.00	$19.00	$19.00	$19.00	$19.00	$19.00
1926.....	21.40	20.60	21.00	20.40	20.00	19.50	19.50	19.90	20.00	20.00	20.00	20.00
1925.....	22.00	22.00	21.60	21.00	19.50	18.75	19.00	19.35	19.50	19.60	21.00	21.00
1924.....	22.90	24.00	23.50	23.00	22.50	20.25	19.50	19.75	20.00	20.00	20.90	22.00
1923.....	27.90	28.40	30.75	31.00	31.00	28.25	26.50	26.00	24.90	23.90	22.50	22.50
1922.....	19.60	19.15	19.00	20.30	22.70	23.25	24.15	27.00	33.75	32.40	29.25	27.00
1921.....	34.60	30.00	27.50	25.85	24.50	22.80	20.50	20.15	20.30	21.00	20.50	20.00
1920.....	39.50	43.00	43.25	43.25	44.00	44.00	44.00	46.50	46.80	46.00	44.00	37.25
1919.....	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	28.80	31.75	36.55
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	30.00	30.75	35.80	37.75	41.20	47.50	54.50	55.00	49.25	33.00	33.00	33.00
1916.....	18.30	18.50	18.30	18.50	18.50	18.15	18.45	18.40	18.15	19.40	24.00	30.00
1915.....	12.75	12.75	12.75	12.75	12.56	12.50	12.60	13.65	14.20	14.90	16.15	17.00
1914.....	13.00	13.00	13.25	13.50	13.50	13.50	13.00	13.50	13.00	13.00	12.65	12.65
1913.....	17.90	17.50	17.20	16.85	16.20	15.90	15.40	15.20	15.20	14.75	14.70	13.50

Lake Superior Charcoal, Delivered, Chicago, 1907-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.04	$27.07	$27.04	$27.04
1926.....	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	27.04	27.04	27.04
1925.....	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04
1924.....	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04
1923.....	33.15	33.53	35.53	36.55	36.55	36.65	36.62	32.10	32.04	30.04	28.65	29.04
1922.....	31.50	30.50	26.90	26.50	28.40	30.00	31.65	33.75	36.15	36.15	36.15	36.15
1921.....	40.25	38.50	38.50	38.50	38.50	38.50	36.87	34.30	33.25	32.50	32.25	31.50
1920.....	48.75	55.65	57.50	57.50	57.50	57.50	57.50	57.50	58.30	58.50	58.50	53.50
1919.....	38.70	38.70	38.70	33.25	31.75	31.75	31.75	32.75	32.75	33.15	35.50	41.00
1918.....	37.50	37.50	37.50	37.50	37.50	37.50	37.70	37.70	37.70	37.70	38.70	38.70
1917.....	33.75	34.50	37.55	42.25	49.25	51.80	59.50	59.50	59.50	48.50	37.50	37.50
1916.....	19.25	19.50	19.75	19.75	19.75	19.75	19.75	19.75	19.75	20.35	21.95	31.75
1915.....	15.75	15.75	15.75	15.75	15.25	15.25	15.75	15.75	15.95	16.25	17.50	19.25
1914.....	15.50	15.50	15.50	15.50	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75
1913.....	18.25	18.00	18.00	18.00	18.00	16.75	16.75	15.00	15.00	15.75	15.50	15.50
1912.....	16.50	16.50	16.50	15.50	15.75	15.75	16.25	16.75	17.75	18.75	18.75	18.75
1911.....	17.50	17.50	17.50	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	16.50
1910.....	19.50	19.50	19.00	19.00	19.00	18.50	18.50	18.50	18.50	18.00	18.00	17.50
1909.....	19.50	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70
1908.....	22.80	21.50	21.50	21.10	19.85	19.50	19.50	19.50	19.50	19.50	19.50	19.50
1907.....	25.50	26.75	25.50	26.00	27.10	27.40	27.10	27.00	26.75	26.10	25.25	23.50

Market History —

Standard Low Phosphorus, Del. Eastern Pennsylvania, 1911-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$25.76	$25.76	$25.76	$25.76	$25.76	$25.76	$25.76	$25.26	$25.26	$25.26	$24.76	$24.76
1926	24.76	24.76	24.76	24.76	24.76	24.26	24.26	24.26	24.51	24.76	25.76	25.76
1925	26.76	26.76	26.76	26.26	25.26	25.26	25.26	25.26	24.01	24.51	24.76	24.76
1924	27.76	27.76	26.76	26.86	27.26	27.26	27.26	26.26	26.26	26.26	26.76	29.79
1923	29.75	31.35	35.45	35.45	35.80	34.80	33.80	32.80	30.50	30.50	30.00	29.76
1922	35.00	34.00	34.00	34.00	35.35	35.35	35.15	38.00	40.00	40.00	40.00	40.00
1921	47.70	46.80	46.80	44.15	43.30	43.30	43.30	43.30	43.30	43.30	43.30	35.30
1920	51.60	53.55	53.80	53.80	54.80	60.20	57.80	59.60	65.30	65.30	*65.30	*65.30
1919	51.00	51.00	49.90	46.75	45.80	42.25	41.10	40.25	40.25	40.35	43.00	47.50
1918	55.50	55.50	55.50	55.50	55.50	55.50	56.00	56.00	56.00	57.00	57.00	57.00
1917	54.50	57.50	66.70	75.50	77.00	85.00	92.50	92.50	82.00	55.50	55.50	55.50
1916	32.00	32.00	32.00	33.00	34.00	34.00	33.00	33.00	34.00	40.00	46.00	55.00
1915	19.00	19.00	20.00	20.00	20.00	20.50	21.50	23.50	24.50	28.00	30.00	32.00
1914	21.00	21.00	21.00	21.00	21.00	20.50	20.50	21.00	21.00	21.00	19.00	19.00
1913	24.50	24.50	24.00	23.50	23.50	23.50	23.50	23.00	23.00	23.00	21.50	21.00
1912	19.25	19.00	19.00	19.50	19.75	19.75	20.00	21.00	21.50	22.50	24.00	24.50
1911	21.50	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.25	19.50	19.25

*Nominal.

No. 2X Foundry, f.o.b. Buffalo, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$19.75	$18.90	$18.15	$18.00	$18.00	$17.90	$17.50	$17.45	$18.00	$18.00	$17.60	$17.50
1926	21.50	21.50	21.50	21.50	21.25	20.50	19.80	20.00	20.00	20.00	20.00	20.00
1925	23.50	22.75	22.50	20.90	19.25	19.00	19.00	19.00	19.00	19.50	21.25	21.50
1924	23.10	22.75	22.00	21.50	20.50	19.90	19.30	19.10	19.50	19.60	20.90	22.00
1923	28.00	28.50	29.40	30.10	29.80	29.50	26.60	25.50	25.25	23.00	20.70	22.00
1922	19.80	19.15	18.30	20.75	23.00	23.85	25.35	31.50	33.75	31.50	27.85	26.00
1921	33.75	31.25	28.25	26.75	26.25	23.85	21.75	21.25	21.05	20.40	20.00	20.00
1920	41.50	44.60	45.15	46.25	46.25	46.25	46.25	48.75	51.25	51.25	46.00	48.25
1919	32.25	32.25	31.45	28.00	28.00	28.00	28.00	28.70	28.75	29.90	34.45	39.50
1918	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	35.25	35.25	35.25
1917	35.00	35.00	38.15	40.00	42.75	49.15	53.50	54.00	49.05	33.50	33.50	33.50
1916	18.50	18.60	18.85	19.15	19.00	18.75	18.75	18.75	18.90	20.70	26.65	33.65
1915	13.15	13.05	12.55	12.75	12.75	12.75	12.80	13.70	15.15	15.80	16.70	18.00
1914	13.00	13.00	13.75	13.90	13.50	13.05	13.05	13.20	13.25	12.60	12.45	13.10
1913	17.25	17.00	17.00	16.50	15.50	14.75	14.00	14.00	14.25	14.00	14.00	14.00

No. 2X f.o.b. Virginia Furnace, 1911-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$21.75	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$21.50	$21.50	$21.50	$21.25	$21.00
1926	23.50	23.25	23.25	23.25	23.00	23.00	22.75	22.75	23.00	22.50	22.75	23.00
1925	24.50	24.50	24.50	23.50	23.35	23.00	23.00	23.00	23.00	23.00	23.00	23.30
1924	25.00	25.75	26.00	25.50	25.50	25.50	24.50	24.50	24.50	24.50	24.50	25.00
1923	27.50	27.50	28.25	29.25	28.60	28.00	27.25	26.25	25.50	25.00	25.00	24.50
1922	21.75	22.00	22.50	22.85	23.50	24.50	26.00	26.00	33.00	33.00	31.40	27.75
1921	34.50	31.25	28.05	27.10	27.00	26.00	24.50	24.00	23.00	23.25	22.80	22.50
1920	41.25	42.75	43.25	44.25	45.75	46.25	46.75	49.25	50.25	49.75	45.75	42.05
1919	35.25	33.00	31.55	28.45	27.50	26.50	26.50	28.25	29.25	30.35	33.40	38.25
1918	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	37.50	38.00	38.00
1917	26.50	28.25	34.25	38.30	41.00	46.50	52.25	51.90	46.50	33.50	33.50	33.50
1916	17.25	18.00	18.25	18.50	18.50	18.50	18.50	18.50	17.50	18.50	23.75	27.00
1915	12.50	12.50	12.50	12.50	12.50	12.50	12.50	13.00	13.50	14.00	15.50	17.00
1914	12.75	12.75	12.75	12.75	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
1913	16.00	15.50	15.50	15.00	14.50	13.75	13.00	13.00	13.00	13.00	13.00	12.75
1912	12.25	12.25	12.25	13.00	13.00	13.25	13.50	14.00	14.50	15.50	16.00	16.00
1911	12.75	12.75	13.00	13.00	13.00	12.25	12.25	12.25	12.25	12.25	12.25	12.25

Semifinished Material

Per Gross Ton f.o.b.

Bessemer Billets, Pittsburgh, 1895-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$35.00	$34.00	$33.60	$33.50	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00
1926	35.50	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1925	37.40	37.60	37.75	35.80	35.35	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1924	40.00	40.00	40.00	40.00	39.20	38.00	38.00	38.00	37.10	36.60	35.50	35.50
1923	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	39.00	29.00
1920	49.60	61.25	65.00	68.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38.50	39.30	40.85	45.00
1918	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917	62.50	64.85	69.30	75.20	88.65	95.60	102.25	92.25	74.05	58.75	47.50	47.50
1916	34.05	35.50	41.10	46.25	46.10	43.00	42.50	45.15	47.50	48.10	53.10	59.50
1915	19.75	20.00	20.00	20.00	20.05	20.35	21.45	23.00	24.70	25.20	27.10	30.75
1914	20.00	20.90	21.05	21.05	20.00	19.80	19.55	20.05	21.00	20.40	19.25	18.85
1913	28.90	28.90	29.00	29.00	27.80	26.75	26.75	26.30	25.00	23.00	21.10	20.10
1912	20.00	20.00	19.90	20.00	21.10	21.90	22.25	22.40	23.75	25.70	26.75	27.00
1911	23.00	23.00	23.00	23.00	23.00	21.00	21.00	21.00	21.00	20.00	19.70	19.25
1910	27.87	27.50	27.50	27.00	26.10	25.50	25.00	25.00	24.50	23.40	23.00	23.00
1909	25.00	23.50	23.00	22.00	22.50	23.00	24.00	25.00	26.00	26.50	27.50	27.50
1908	28.00	28.00	28.00	28.00	28.00	26.50	25.00	25.00	25.00	25.00	25.00	25.00
1907	29.75	29.50	29.25	29.75	30.25	31.00	30.00	30.00	29.50	28.50	28.00	28.00
1906	27.00	27.50	27.65	27.75	27.00	26.25	27.00	28.00	28.50	28.50	29.00	29.75
1905	21.00	24.90	24.60	25.50	23.50	22.00	22.00	23.50	25.75	25.95	26.30	26.50
1904	23.00	23.00	23.00	23.00	22.00	21.50	21.00	20.00	19.50	19.50	21.00	21.00
1903	29.75	30.00	30.25	31.00	30.50	29.50	27.50	27.00	27.00	26.50	23.50	23.00
1902	28.05	29.80	31.35	32.25	33.90	35.20	33.50	32.10	31.50	29.80	29.00	29.25
1901	19.70	19.75	20.80	24.10	24.20	24.45	24.25	24.40	24.10	26.80	28.25	27.60
1900	35.00	35.00	35.00	34.50	29.00	27.25	22.50	18.00	17.50	17.50	19.30	19.75
1899	16.75	18.25	24.00	25.50	27.00	31.50	33.50	36.50	39.00	37.50	36.00	35.00
1898	15.00	15.00	15.25	15.25	14.85	14.75	14.75	15.45	16.10	15.75	15.25	16.00
1897	15.25	15.50	15.50	14.75	14.00	14.25	14.00	14.15	15.75	16.50	15.75	15.00
1896	17.05	17.65	17.50	18.90	19.50	19.75	19.90	19.75	19.60	20.25	20.00	17.00
1895	14.85	15.00	14.85	15.40	16.75	18.75	20.85	22.00	24.25	22.00	19.50	17.00

Market History —

Open-Hearth Billets, Pittsburgh, 1910-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$35.00	$34.00	$33.60	$33.50	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00	$33.00
1926	35.50	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1925	37.75	37.65	37.75	35.80	35.40	33.90	35.00	35.00	35.00	35.00	35.00	35.00
1924	40.00	40.00	40.00	40.00	39.20	38.00	38.00	38.00	37.10	36.60	35.50	35.50
1923	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	29.00	29.00
1920	49.60	61.25	66.25	70.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38.50	39.30	40.85	45.00
1918	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917	60.00	62.50	67.00	72.50	85.00	93.75	100.00	93.00	73.75	58.75	47.50	47.50
1916	34.75	35.00	40.60	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	58.75
1915	19.50	19.50	19.50	19.50	19.50	19.85	21.50	24.00	25.60	26.50	28.00	30.20
1914	20.00	20.75	21.00	20.80	20.00	19.75	19.30	20.00	21.00	20.60	19.00	18.50
1913	28.70	29.40	29.50	29.50	28.10	26.50	26.50	26.10	25.00	23.00	20.85	20.00
1912	19.75	19.50	19.40	20.25	21.00	21.25	21.75	21.75	21.75	21.75	21.75	28.00
1911	23.00	23.00	23.00	23.00	22.00	21.00	21.00	21.00	20.25	19.50	19.75	19.25
1910	28.00	28.00	28.50	28.75	28.75	27.00	26.50	26.00	25.00	24.00	23.25	23.00

Wire Rods, Pittsburgh, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$45.00	$43.50	$43.00	$42.50	$42.00	$42.00	$43.00	$43.00	$43.00	$42.50	$41.00	$40.00
1926	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
1925	48.00	48.00	48.00	47.75	46.00	45.25	45.00	45.00	45.00	45.00	45.00	45.30
1924	51.00	51.00	51.00	51.00	48.40	48.00	48.00	46.00	45.75	45.00	45.50	48.00
1923	45.00	47.50	47.00	46.60	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1922	37.00	35.75	35.80	38.00	38.00	38.00	39.50	40.00	45.00	45.00	46.50	46.50
1921	57.00	57.00	52.00	50.00	48.00	47.00	42.25	42.00	40.80	40.00	38.00	38.00
1920	52.00	56.00	62.50	70.00	70.00	70.00	70.00	70.00	70.00	75.00	72.50	57.00
1919	57.00	57.00	55.75	52.00	52.00	52.00	52.00	52.00	52.00	52.00	56.00	62.00
1918	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.25	57.50	57.50	57.50
1917	73.75	75.00	75.00	83.75	88.00	92.50	95.00	96.00	90.00	73.50	57.00	57.00
1916	46.25	50.00	51.00	55.00	60.00	60.00	58.75	55.00	55.00	55.00	64.00	69.00
1915	25.00	25.00	25.00	25.00	25.00	25.00	25.60	26.75	28.50	30.00	34.50	39.00
1914	25.50	25.90	26.00	26.00	26.00	25.50	24.80	24.50	25.60	26.00	25.75	25.00
1913	30.00	30.00	30.00	30.00	30.00	29.50	28.60	27.60	27.50	26.80	26.00	25.75

Open-Hearth Sheet Bars, Pittsburgh, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$36.00	$35.00	$34.00	$33.75	$33.75	$33.50	$33.50	$33.50	$33.90	$34.00	$34.00	$34.00
1926	36.50	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
1925	39.25	39.00	38.25	37.00	36.25	35.00	35.00	35.00	35.00	35.00	35.00	36.80
1924	42.50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
1923	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920	53.40	65.00	72.50	78.00	78.75	75.00	75.00	71.25	68.50	63.75	56.25	47.65
1919	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1917	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	51.00
1916	34.75	35.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914	20.60	21.75	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913	29.20	29.90	30.00	30.00	28.80	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Bessemer Sheet Bars, Pittsburgh, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$36.00	$35.00	$34.00	$33.75	$33.75	$33.50	$33.50	$33.50	$33.90	$34.00	$34.00	$34.00
1926	36.50	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
1925	39.20	39.00	38.50	37.00	36.25	35.00	35.00	35.00	35.00	35.00	35.00	36.80
1924	42.50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
1923	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920	53.40	65.00	70.00	70.00	75.00	70.00	70.00	70.00	68.50	63.75	56.25	47.65
1919	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00
1917	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	57.00
1916	33.75	34.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914	21.00	22.00	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913	28.70	29.40	29.50	29.50	28.40	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Beehive Coke

Per Net Ton

Furnace, Spot, Connellsville, 1914-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$3.35	$3.35	$3.30	$3.20	$2.80	$2.85	$2.90	$3.00	$2.85	$2.85	$2.80	$2.65
1926	6.90	7.45	3.15	3.05	2.85	2.70	2.65	2.85	3.25	3.65	4.75	3.65
1925	4.10	3.65	3.35	3.10	3.10	2.80	2.80	3.10	3.45	5.65	6.35	3.90
1924	3.80	4.00	4.05	3.55	3.25	3.15	2.85	3.00	3.00	3.00	3.00	3.35
1923	8.25	7.20	7.15	6.25	5.10	4.65	4.35	4.45	4.55	3.85	3.80	4.20
1922	2.75	2.95	3.25	4.30	6.00	6.60	10.65	13.20	11.00	10.60	7.10	6.25
1921	5.15	4.85	4.55	3.60	3.25	3.15	2.75	2.85	3.15	3.25	3.15	2.95
1920	6.00	6.00	6.00	11.20	12.00	14.50	15.20	17.75	16.90	15.15	8.40	6.25
1919	5.85	4.40	4.30	4.05	3.95	4.10	4.25	4.60	4.95	4.35	5.75	6.20
1918	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1917	9.05	11.20	9.40	7.60	8.35	11.40	12.10	13.70	12.10	6.00	6.00	6.00
1916	2.50	3.00	3.00	2.25	2.25	2.55	2.70	2.75	2.95	5.30	7.05	8.25
1915	1.60	1.55	1.50	1.50	1.55	1.55	1.70	1.50	1.60	1.70	2.10	2.10
1914	1.80	1.80	1.95	1.90	1.75	1.75	1.75	1.75	1.65	1.65	1.60	1.60

Market History —

Foundry, Spot, Connellsville, 1900-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$4.25	$3.85	$4.15	$4.05	$3.80	$3.90	$4.00	$4.00	$4.00	$3.75	$3.75	$3.65
1926.....	6.40	6.50	4.45	4.10	3.85	3.75	3.70	3.60	4.15	4.65	5.85	4.75
1925.....	5.10	4.30	3.85	3.85	3.70	3.75	3.75	3.80	4.20	5.95	6.85	5.30
1924.....	4.35	4.80	4.85	4.60	4.30	4.15	4.05	4.00	4.00	4.00	4.05	4.25
1923.....	9.00	8.60	8.15	7.80	6.10	5.50	5.15	5.20	5.70	4.80	4.85	5.15
1922.....	3.85	3.80	4.05	4.95	6.50	7.20	11.40	14.30	12.75	12.10	8.40	7.50
1921.....	6.50	6.30	6.05	5.00	4.85	4.50	4.45	4.00	4.30	4.50	4.30	4.15
1920.....	7.00	7.00	7.00	11.60	12.50	15.00	16.00	18.25	17.90	16.85	9.40	7.25
1919.....	7.05	5.15	4.80	4.55	4.35	4.70	4.80	5.20	5.90	5.60	6.95	7.15
1918.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1917.....	10.40	10.90	11.30	9.65	9.65	11.20	15.00	12.70	13.35	7.00	7.00	7.00
1916.....	3.75	3.75	3.60	3.85	3.10	3.00	3.00	3.05	3.25	4.35	8.60	9.25
1915.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.25	2.30	2.95	3.15
1914.....	2.50	2.40	2.40	2.40	2.40	2.35	2.30	2.25	2.25	2.20	2.10	2.00
1913.....	4.45	3.70	3.50	3.05	2.90	2.85	2.85	2.85	2.85	2.75	2.50	2.50
1912.....	2.05	2.20	2.65	2.75	2.60	2.55	2.45	2.60	2.65	3.35	4.40	4.50
1911.....	1.95	1.95	2.00	2.00	1.90	1.75	1.80	1.85	1.85	1.85	1.90	1.90
1910.....	3.00	2.90	2.80	2.55	2.30	2.15	2.10	2.15	2.10	2.05	2.00	2.00
1909.....	1.70	1.60	1.55	1.50	1.45	1.50	1.50	1.65	2.30	2.75	2.80	2.75
1908.....	1.80	1.75	1.70	1.65	1.65	1.65	1.65	1.65	1.65	1.70	1.75	1.80
1907.....	3.75	3.55	3.00	2.70	2.15	2.05	2.40	2.60	2.80	2.90	2.40	2.00
1906.....	3.00	2.40	2.35	2.60	2.55	2.40	2.55	2.70	2.75	2.85	3.20	3.60
1905.....	2.80	2.50	2.50	2.00	1.90	1.85	1.80	1.85	2.00	2.70	3.00	2.85
1904.....	1.45	1.50	1.55	1.50	1.45	1.40	1.40	1.40	1.40	1.45	1.85	2.15
1903.....	4.50	4.50	4.00	3.75	3.50	3.00	2.50	2.00	2.00	1.90	1.90	1.75
1902.....	2.25	2.25	2.50	2.50	2.50	2.50	2.50	3.25	4.00	5.00	5.00	5.00
1901.....	1.75	1.75	2.00	2.00	2.00	1.85	1.75	1.75	1.75	2.00	2.00	2.00
1900.....	3.00	3.50	4.00	3.75	3.00	2.50	2.00	1.75	1.75	1.75	1.75	1.75

By-Product Coke

Per Net Ton

Newark, Delivered, 1921-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$9.84	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59	$9.59
1926.....	11.01	11.01	11.01	9.59	9.59	9.59	9.59	9.59	9.59	9.59	10.59	10.59
1925.....	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.71	11.04	11.52
1924.....	10.91	10.91	10.91	10.81	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41
1923.....	12.84	12.84	12.84	12.84	12.34	11.84	11.34	11.34	11.34	11.41	10.91	10.91
1922.....	8.59	8.59	8.59	8.84	9.49	10.34	11.47	14.04	14.84	14.84	13.28	12.84
1921.....	.....	.....	.....	.....	.....	.....	8.84	8.84	8.84	8.84	8.84	8.84

St. Louis, Ovens, 1921-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$10.50	$10.50	$10.50	*$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75
1926.....	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.25	10 50
1925.....	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.15	9.50	9.80	10.00	10.00
1924.....	12.50	12.50	12.50	12.00	12.00	10.60	9.20	9.00	9.00	9.00	9.00	9.00
1923.....	14.00	14.25	14.20	14.00	14.00	14.00	14.00	13.00	13.00	13.00	13.00	13.00
1922.....	9.50	9.50	9.30	9.00	9.00	9.00	9.00	11.40	13.00	14.00	14.00	14.00
1921.....	....	....	....	....	....	....	....	....	....	....	....	9.50

*Granite City previous to April 1927.

Boston, Delivered, 1921-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$13.50	$12.65	$12.50	$12.50	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00
1926.....	13.00	13.00	13.00	12.50	12.50	12.00	12.00	12.00	12.00	12.00	13.00	13.50
1925.....	11.50	12.00	12.00	12.00	12 00	11.50	11.50	11.65	12.00	12.00	12.90	13.00
1924.....	12.50	12.50	12.50	12.00	12.00	11.30	*11.80	11.50	11.50	11.50	11.50	11.50
1923.....	16.00	16.00	16.00	16.00	16.00	15.50	13.50	13.50	13.50	13.50	12.50	12.50
1922.....	10.40	10.25	10.15	10.15	10.15	10.15	14.00	16.30	16.50	16.50	16.20	16.00
1921.....	.....	.....	.....	.....	.....	.....	.....	.....	10.66	10.66	10.66	10.66

*From this point forward—New England delivered.

Chicago, Ovens, 1921-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.75	$9.30	$9.00
1926.....	10.50	10.50	10.50	9.95	9.75	9.75	9.75	9.75	9.75	9.75	9.75	10.25
1925.....	10.75	10.75	10.75	10.75	10.75	10.75	9.75	9.75	9.75	10.25	10.45	10.50
1924.....	12.50	12.50	12.50	12.50	12.50	12.50	11.45	10.75	10.75	10.75	10.75	10.75
1923.....	15.00	15.00	15.00	15.00	15.00	15.00	13.50	13.50	13.50	13.50	12.50	12.50
1922.....	11.25	11.25	11.25	11.25	11.25	11.25	11.25	12.60	13.50	13.50	14.70	15.00
1921.....	.....	.....	.....	.....	.....	.....	11.25	11.25	11.25	11.25	11.25	11.25

Iron and Steel Scrap

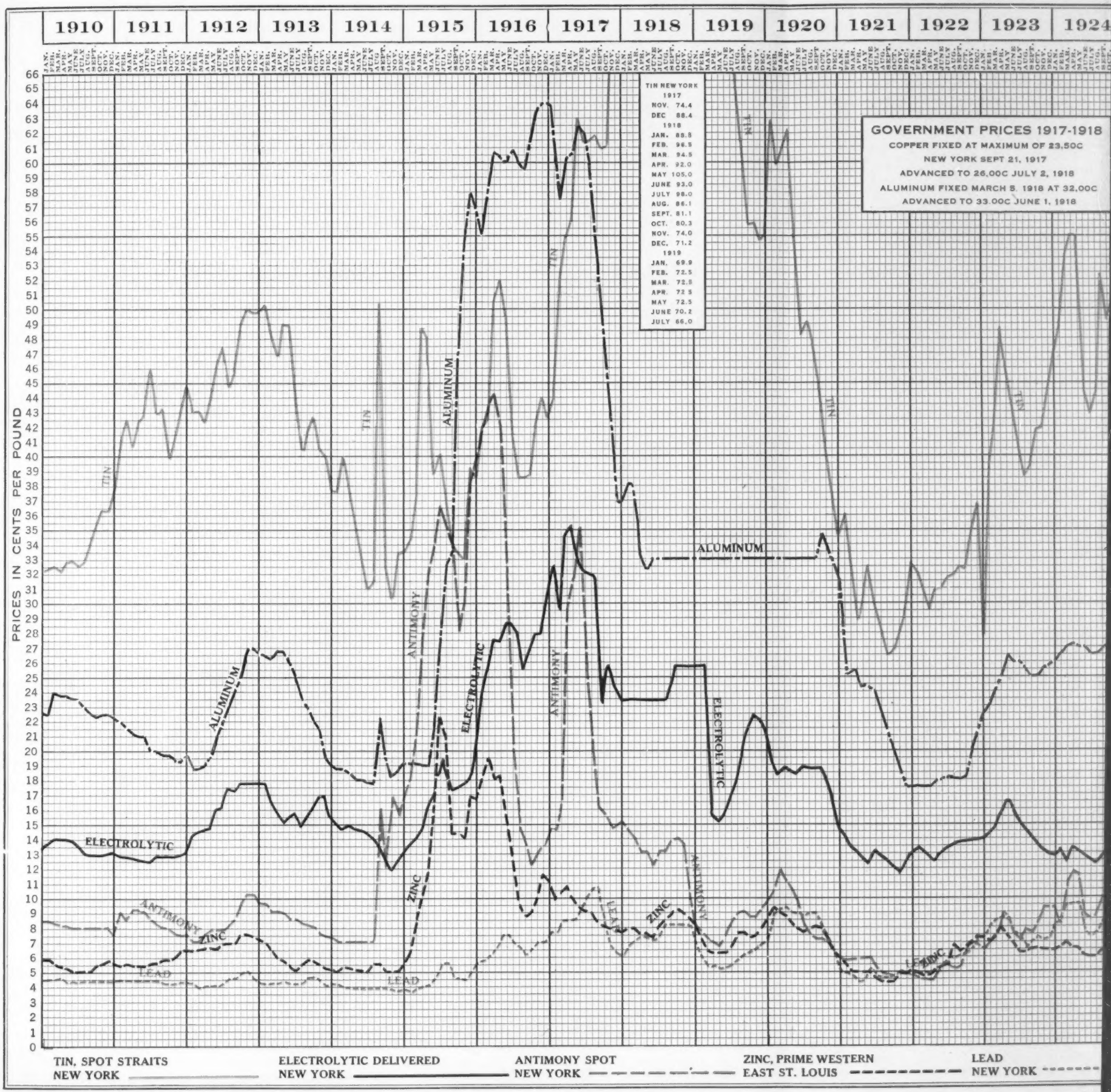
Per Gross Ton Delivered

Low Phosphorus Scrap, Pittsburgh, 1917-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$20.25	$19.50	$20.00	$20.50	$19.10	$19.10	$19.00	$19.00	$20.00	$19.50	$18.60	$18.50
1926.....	24.00	22.00	21.50	20.90	19.50	19.75	20.30	21.75	21.60	20.25	20.40	20.30
1925.....	26.20	25.35	23.85	21.60	21.75	22.40	22.50	22.50	23.00	23.40	24.00	24.00
1924.....	23.90	24.25	23.75	20.60	19.30	21.40	21.70	22.00	22.25	22.30	23.50	25.00
1923.....	25.15	27.00	31.30	32.10	28.30	25.00	23.15	22.70	23.50	22.50	20.70	22.50
1922.....	17.50	17.10	17.10	18.60	20.00	20.60	21.00	20.60	22.90	24.85	25.00	24.50
1921.....	24.50	22.00	21.20	18.25	18.00	17.00	15.25	15.50	16.30	18.00	17.65	17.25
1920.....	31.50	33.00	32.60	30.60	30.00	30.75	30.00	33.15	34.00	33.75	31.00	25.50
1919.....	29.40	24.25	22.50	22.40	22.00	21.25	23.00	24.00	24.00	24.00	25.75	27.50
1918.....	42.20	40.00	40.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	38.60	38.50
1917.....	32.00	30.00	33.00	34.25	36.60	43.50	52.75	43.00	47.25	43.50	39.00	39.00

IRON TRADE REVIEW

Fluctuations in prices of pig tin, aluminum, antimony, electrolytic copper, zinc a



Supplement to IRON TRADE REVIEW, Jan. 5, 1928 issue.

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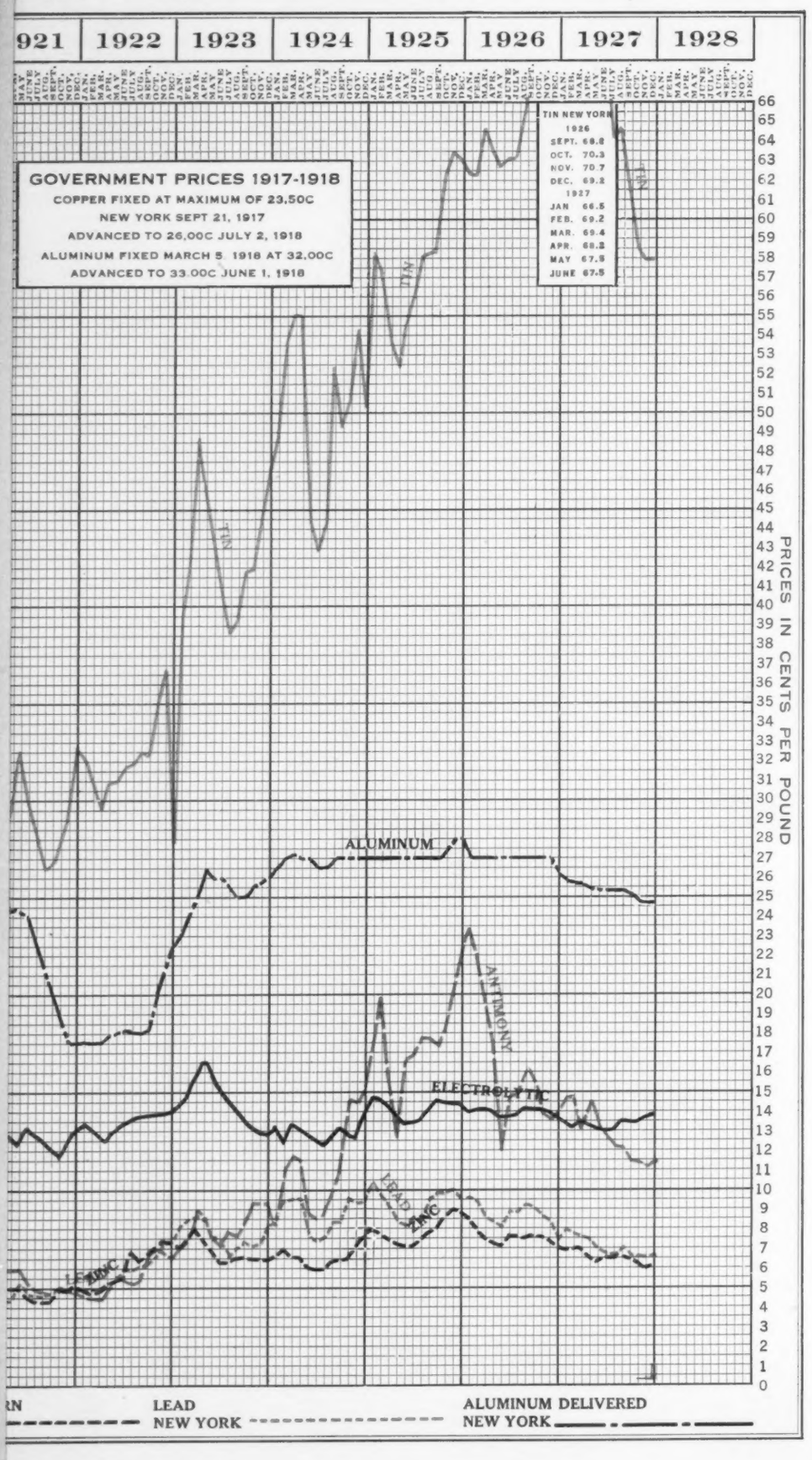
olytic copper, zinc and lead, 1910-1927



Market History —

Heavy Melting Steel, Pittsburgh, 1902-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$17.00	$16.10	$16.40	$16.50	$15.50	$15.10	$14.95	$15.00	$15.00	$14.50	$14.50	$14.60
1926.....	18.75	17.60	17.70	16.90	16.00	15.85	16.70	17.75	17.75	17.00	17.00	16.75
1925.....	22.10	19.00	18.25	17.00	16.60	17.10	17.20	19.25	19.00	18.40	19.50	19.00
1924.....	21.10	21.60	19.75	16.60	15.40	16.25	17.30	17.75	18.60	18.20	19.85	21.00
1923.....	21.65	23.40	26.10	25.85	22.50	20.50	18.25	17.50	18.00	16.10	15.70	18.50
1922.....	14.50	14.70	14.95	16.50	17.00	16.85	16.50	17.10	19.50	21.35	20.30	20.00
1921.....	15.00	15.00	15.00	13.00	13.60	13.10	12.00	12.60	11.30	14.00	14.25	14.25
1920.....	26.50	28.15	28.00	26.40	25.50	25.30	25.70	27.75	28.60	28.00	24.00	18.75
1919.....	20.80	17.00	14.60	15.75	15.55	17.25	19.90	21.25	20.50	20.00	21.90	24.65
1918.....	30.00	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
1917.....	23.25	21.90	23.40	28.15	28.40	40.00	40.25	36.60	35.50	31.30	29.60	30.00
1916.....	17.50	17.35	17.95	18.10	17.10	16.25	16.25	16.00	16.10	17.80	20.55	26.75
1915.....	11.55	11.60	12.00	11.90	11.75	11.75	11.75	13.38	14.25	14.00	15.30	17.40
1914.....	11.30	12.15	12.40	12.25	12.00	12.00	12.00	11.65	11.65	11.40	10.40	10.45
1913.....	15.15	14.90	14.40	14.40	14.15	13.50	12.75	12.65	12.65	12.65	11.75	11.20
1912.....	12.50	12.65	12.40	13.00	13.40	13.40	13.65	13.55	13.90	14.40	15.30	15.00
1911.....	13.50	14.30	14.40	13.50	12.75	13.15	12.90	13.40	13.15	12.25	12.15	12.50
1910.....	17.90	17.65	17.00	17.00	16.00	15.25	14.50	14.25	14.25	14.40	14.15	13.75
1909.....	16.50	16.00	14.75	14.15	14.95	15.50	15.75	16.00	16.75	17.90	18.15	17.95
1908.....	13.25	13.25	13.50	12.75	12.75	13.00	13.25	14.75	14.75	14.50	14.75	16.25
1907.....	19.25	18.75	18.25	18.25	18.15	18.65	18.50	18.25	17.75	17.50	15.45	13.75
1906.....	17.75	16.65	15.90	14.65	15.25	15.00	15.75	16.00	16.90	16.75	17.25	19.75
1905.....	16.75	16.15	16.50	16.50	15.40	14.50	14.25	14.15	15.40	16.20	17.15	18.25
1904.....	12.65	13.25	13.75	14.15	13.05	11.50	10.75	11.15	11.75	12.00	13.65	14.90
1903.....	22.25	21.75	21.25	22.15	21.65	20.50	20.25	18.75	18.25	16.00	14.50	11.50
1902.....	17.25	17.45	18.55	19.40	20.25	21.40	22.25	21.25	21.25	21.65	21.15	22.25

Heavy Melting Steel, Chicago, 1909-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$13.20	$13.10	$13.05	$13.10	$12.35	$12.00	$12.10	$12.35	$12.20	$11.75	$11.50	$11.95
1926.....	14.95	13.75	14.00	13.20	12.25	12.65	14.20	14.00	14.10	13.05	13.00	12.90
1925.....	19.45	17.55	16.70	15.00	14.90	15.90	15.35	16.05	16.45	16.25	16.40	15.80
1924.....	17.40	18.00	16.70	14.65	13.75	13.55	14.75	15.40	16.40	16.25	17.05	18.50
1923.....	18.70	19.75	23.15	22.40	19.75	17.75	17.10	16.25	16.55	14.50	13.80	16.00
1922.....	11.20	11.15	12.05	13.55	14.65	14.45	15.15	15.85	18.15	18.50	17.40	16.75
1921.....	15.25	15.25	12.55	11.25	11.50	11.20	10.55	10.70	11.30	12.55	12.40	11.00
1920.....	24.25	25.05	24.20	23.95	23.15	22.40	23.70	24.15	24.20	21.40	18.50	16.75
1919.....	19.20	14.90	15.25	16.40	15.40	16.75	19.40	20.75	19.00	18.80	20.65	21.25
1918.....	29.70	30.00	30.00	28.65	28.90	29.00	29.00	29.00	29.00	29.00	29.00	26.50
1917.....	20.25	21.65	23.00	26.65	28.70	37.00	35.50	33.10	32.65	27.00	28.50	28.90
1916.....	15.50	15.25	16.20	16.75	16.50	15.35	14.15	14.90	15.50	16.50	19.35	23.35
1915.....	8.90	9.45	9.75	9.30	9.25	9.40	10.15	11.50	12.00	11.55	13.15	15.40
1914.....	9.20	10.00	9.80	9.50	9.95	9.75	9.50	9.50	9.40	9.00	8.25	8.25
1913.....	12.75	12.50	12.50	12.50	12.00	12.00	12.00	12.00	12.00	12.00	9.00	9.00
1912.....	11.00	10.75	11.25	12.25	12.25	12.25	11.75	12.50	13.00	14.00	13.75	13.75
1911.....	11.50	12.00	12.00	11.50	10.25	10.25	10.25	10.75	10.50	10.00	9.75	9.75
1910.....	16.00	15.50	14.50	14.50	13.00	13.00	12.50	12.25	12.25	12.25	12.00	12.00
1909.....	14.00	13.40	12.15	12.90	13.50	14.15	14.05	14.95	15.80	16.30	15.75	15.50

Heavy Melting Steel, Eastern Pennsylvania, 1909-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$15.60	$15.00	$14.75	$14.75	$14.45	$14.25	$13.75	$13.75	$14.00	$14.00	$14.00	$14.00
1926.....	17.35	16.35	16.20	15.90	15.25	15.25	15.50	16.75	16.85	16.65	15.95	15.50
1925.....	20.00	17.85	16.25	15.50	15.00	15.65	16.00	16.75	17.25	17.00	17.60	17.70
1924.....	18.05	18.95	17.00	15.25	14.20	15.00	15.00	16.50	15.90	16.50	18.05	19.00
1923.....	19.70	21.20	24.85	23.50	20.40	18.65	17.25	16.00	16.85	15.50	15.50	17.00
1922.....	11.75	12.25	13.15	14.35	15.15	15.30	15.00	15.25	17.10	18.00	16.70	16.00
1921.....	15.00	14.50	13.40	11.75	11.80	11.85	11.25	11.75	11.75	12.25	12.60	12.00
1920.....	24.25	25.75	25.55	24.30	23.60	22.40	22.00	24.10	26.40	23.80	20.30	16.90
1919.....	19.00	15.25	14.25	15.85	15.30	16.15	18.85	19.60	19.00	19.55	20.80	23.90
1918.....	29.80	30.00	29.50	28.30	28.50	28.50	28.50	28.50	28.50	28.50	28.00	25.00
1917.....	21.75	20.25	23.50	25.00	26.00	32.60	37.00	32.80	30.75	26.00	26.80	28.00
1916.....	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915.....	10.00	10.50	11.00	11.25	11.50	11.50	12.00	13.50	14.50	15.00	14.50	16.00
1914.....	10.50	11.25	11.50	11.00	10.75	10.75	10.50	10.75	10.75	9.75	9.50	9.50
1913.....	14.50	13.50	13.50	13.75	12.50	12.00	11.50	11.75	12.00	11.00	10.25	10.00
1912.....	12.25	12.00	12.25	13.00	13.75	13.50	13.75	14.25	14.75	15.50	15.25	15.00
1911.....	12.75	14.25	14.25	13.75	13.25	13.00	13.00	13.25	12.75	12.00	12.25	12.50
1910.....	17.00	16.50	16.50	15.50	14.50	14.50	14.00	13.75	14.00	13.50	12.75	12.50
1909.....	17.00	15.50	13.75	13.50	14.50	15.50	16.00	17.00	17.50	18.00	18.00	17.25

Cast Borings, Pittsburgh, 1902-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$12.50	$12.00	$12.10	$12.38	$11.13	$10.50	$10.50	$11.50	$11.30	$11.00	$11.00	$11.00
1926.....	14.75	14.25	13.25	12.60	11.75	11.85	12.20	12.75	13.00	12.60	12.50	12.50
1925.....	17.20	15.60	14.50	13.60	12.85	13.40	13.50	14.50	14.85	14.10	15.10	14.80
1924.....	16.50	16.60	15.35	13.65	12.00	13.85	13.75	14.20	14.75	15.20	16.25	17.00
1923.....	18.50	19.75	21.80	21.10	21.60	17.50	15.50	15.00	16.00	13.40	12.40	14.00
1922.....	10.40	11.25	11.85	13.00	14.15	14.80	15.75	15.75	17.30	18.15	17.75	17.50
1921.....	12.50	12.35	11.60	9.70	9.50	9.00	7.60	8.00	9.05	11.60	10.65	9.55
1920.....	19.35	21.70	20.35	19.85	19.25	18.35	18.25	19.55	20.50	19.35	17.00	14.50
1919.....	14.00	11.80	10.95	12.60	11.30	11.65	13.90	16.10	15.75	15.75	17.95	18.35
1918.....	20.00	20.00	20.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	18.00
1917.....	12.35	12.25	13.20	14.70	15.45	21.10	23.90	22.00	23.55	20.70	20.00	20.00
1916.....	11.35	11.40	11.40	11.30	10.30	9.90	8.65	8.00	8.50	9.15	9.85	13.35
1915.....	8.25	8.15	8.40	8.40	8.40	8.65	8.65	9.00	9.25	9.75	10.00	10.20
1914.....	7.90	8.40	9.25	8.40	8.40	7.90	8.15	8.50	8.50	8.25	8.25	8.25
1913.....	10.40	10.40	10.40	10.40	10.40	9.25	8.40	8.15	8.15	8.40	7.75	7.45
1912.....	9.65	9.40	9.15	9.65	10.15	10.15	10.25	10.15	9.90	9.90	10.50	10.40
1911.....	8.65	8.65	9.50	8.75	8.50	8.90	8.90	9.25	9.40	8.50	8.25	8.35
1910.....	11.00	10.75	9.75	9.75	9.25	8.75	8.00	8.25	8.40	8.40	8.50	8.65
1909.....	10.75	9.75	8.25	7.75	7.25	9.65	9.75	9.50	10.65	11.15	11.25	11.00
1908.....	6.50	7.50	8.00	8.00	7.50	7.75	7.75	8.75	8.75	8.75	9.75	11.00
1907.....	12.40	12.65	13.15	13.65	13.50	13.75	13.75	13.25	13.25	13.00	9.95	6.50
1906.....	10.90	10.15	9.65	8.15	8.90	8.75	8.75	9.00	9.75	10.25	10.75	12.25
1905.....	10.75	11.25	11.15	10.90	10.15	10.00	9.15	8.40	8.90	9.75	10.50	10.90
1904.....	6.00	5.75	5.40	6.15	7.15	5.65	5.75	5.25	6.25	6.25	7.40	8.75
1903.....	11.25	11.50	11.65	11.25	11.25	.....	.....	9.00	9.00	7.00	.....	5.25
1902.....	8.55	9.15	9.65	10.75	11.75	12.00	11.65	10.75	14.40	15.85	11.65	11.50

Market History—

No. 1 Railroad Wrought, Chicago, 1915-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$14.20	$13.95	$13.50	$13.50	$12.75	$12.10	$12.35	$13.45	$12.70	$11.40	$11.25	$11.25
1926.....	15.00	14.40	14.50	14.05	12.55	12.65	14.80	14.75	14.56	14.50	13.75	13.75
1925.....	19.15	17.75	16.65	14.60	14.65	15.90	15.90	17.45	17.05	16.30	17.70	15.90
1924.....	17.50	17.50	16.05	14.80	13.60	13.25	14.80	15.75	16.70	15.95	17.10	18.75
1923.....	19.40	20.50	23.25	22.75	19.95	16.95	16.60	17.05	18.25	15.30	14.10	16.00
1922.....	11.80	11.65	12.25	13.25	14.35	14.20	15.20	16.35	19.95	20.40	18.10	17.00
1921.....	15.65	15.90	13.50	12.05	11.90	10.80	10.25	11.75	13.05	14.65	13.70	12.10
1920.....	29.00	30.75	30.70	30.70	29.50	28.00	28.10	28.50	27.50	22.50	19.55	16.60
1919.....	23.30	16.65	17.65	18.50	17.05	18.70	21.20	23.25	21.25	22.00	26.50	27.00
1918.....	35.00	35.00	35.00*	35.00	35.00	35.00	35.50	33.50	33.50	33.50	33.50	29.00
1917.....	23.75	24.00	25.75	29.80	32.60	41.75	39.15	35.40	36.25	31.90	30.60	31.50
1916.....	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915.....	8.80	8.90	9.00	8.55	8.75	8.75	8.90	10.10	10.75	10.70	12.75	14.90

*Quotations net tons to March 31, 1918, gross tons thereafter.

No. 1 Railroad Wrought, Eastern Pennsylvania, 1904-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$17.00	$17.00	$17.65	$16.75	$16.75	$16.75	$16.25	$15.95	$15.75	$15.75	$15.75	$15.75
1926.....	18.35	18.00	18.00	17.75	17.35	17.00	17.00	17.25	17.00	17.00	17.00	17.00
1925.....	21.50	20.50	19.50	18.40	17.60	18.20	18.25	18.25	18.25	18.25	18.75	18.75
1924.....	20.10	21.35	19.00	18.40	17.75	17.75	18.05	18.50	18.75	18.75	18.95	19.00
1923.....	22.25	24.10	27.60	27.00	24.40	22.75	18.85	17.50	19.00	18.00	17.75	19.00
1922.....	15.00	15.00	15.20	15.63	16.80	17.25	18.00	18.00	20.75	22.00	21.00	18.95
1921.....	20.00	20.00	18.20	15.50	15.00	15.00	14.25	14.00	14.20	15.40	16.00	15.75
1920.....	32.90	36.10	36.50	35.25	34.00	33.50	33.50	33.25	34.40	29.85	25.75	20.10
1919.....	29.80	25.00	24.00	21.50	21.90	22.50	24.70	27.25	27.00	27.00	27.85	30.75
1918.....	35.00	35.00	35.00*	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	27.00	26.75	30.00	36.00	40.80	47.85	54.05	46.20	44.50	41.80	35.35	35.00
1916.....	22.25	22.50	23.00	23.00	22.50	20.00	19.75	20.00	21.00	22.00	20.55	26.75
1915.....	11.75	12.00	12.50	12.50	12.50	12.75	13.50	15.00	16.00	16.00	17.00	20.00
1914.....	12.90	14.75	15.25	13.15	13.15	12.65	12.65	12.00	12.50	11.50	11.50	11.50
1913.....	16.25	16.25	15.25	16.25	15.50	14.75	14.70	14.25	14.25	14.25	13.75	13.35
1912.....	15.75	14.75	14.50	14.25	16.25	16.00	15.75	15.25	16.65	16.75	17.75	16.75
1911.....	16.25	16.25	17.75	16.75	15.50	15.25	15.25	15.75	15.75	14.50	14.00	14.45
1910.....	18.75	19.00	18.75	19.25	18.25	16.75	16.25	16.25	16.15	16.75	16.25	16.25
1909.....	20.25	19.25	16.25	15.25	16.25	18.60	17.75	18.75	19.75	20.75	21.25	20.25
1908.....	14.25	14.25	15.25	14.75	15.50	15.75	16.00	16.50	18.25	18.25	18.50	19.75
1907.....	23.25	22.25	21.00	20.50	20.00	20.75	20.25	19.75	18.00	18.00	17.25	14.75
1906.....	22.75	21.00	19.75	20.25	20.75	18.25	17.50	18.25	20.75	22.25	22.25	23.25
1905.....	19.75	21.75	22.00	22.75	21.75	18.75	17.00	17.50	19.50	21.75	19.85	23.25
1904.....	14.65	16.00	16.50	18.25	17.75	14.00	12.75	13.25	14.40	15.25	16.25	19.00

*Quotations net tons to March 31, 1918, gross tons thereafter.

Machine Shop Turnings, Pittsburgh, 1906-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$12.00	$11.00	$11.60	$12.40	$11.15	$10.50	$10.85	$12.50	$11.75	$11.50	$11.15	$11.45
1926.....	14.50	13.60	13.00	12.60	11.65	11.00	11.60	12.85	13.05	12.00	11.85	11.50
1925.....	17.80	16.00	14.75	13.60	12.75	13.25	13.50	14.50	14.85	14.15	14.85	14.50
1924.....	15.50	16.10	15.00	13.25	11.10	13.00	13.50	14.00	14.75	14.40	16.00	17.50
1923.....	16.75	18.25	20.65	20.10	18.91	16.60	13.50	11.40	12.75	11.40	11.00	13.50
1922.....	9.50	9.55	10.65	12.30	13.45	13.65	13.75	13.95	15.45	15.40	16.25	15.90
1921.....	10.50	10.50	9.70	8.55	8.50	7.90	7.25	7.65	8.55	10.25	10.25	9.20
1920.....	16.75	19.25	18.40	16.85	15.15	17.65	13.55	15.75	15.80	16.00	14.75	11.60
1919.....	11.50	9.70	9.75	11.15	10.00	10.65	12.70	14.00	13.25	12.75	14.00	15.50
1918.....	20.00	20.00	20.00	19.00	18.70	18.50	18.50	18.50	18.50	18.50	18.50	17.75
1917.....	12.10	12.00	12.45	13.90	14.55	20.80	23.70	21.20	23.25	19.50	19.65	20.00
1916.....	10.35	9.55	10.75	11.20	10.35	10.05	8.55	7.75	7.25	8.00	9.10	12.75
1915.....	7.75	7.90	7.90	7.90	7.90	8.15	8.00	7.65	8.65	8.65	9.15	8.75
1914.....	6.90	7.65	8.70	8.15	8.00	7.90	7.90	7.90	7.90	8.00	7.95	7.75
1913.....	10.65	10.25	9.50	9.00	8.65	7.25	6.75	6.75	6.75	7.15	7.15	6.40
1912.....	10.25	9.75	9.50	10.00	10.25	10.90	11.00	11.00	10.65	10.90	11.50	11.25
1911.....	9.00	9.40	10.50	9.50	9.15	9.15	9.15	9.75	9.65	9.15	9.90	9.35
1910.....	13.25	13.00	12.00	11.75	11.25	10.25	9.25	9.25	9.00	9.00	9.15	9.25
1909.....	13.00	11.75	10.25	8.75	8.25	11.25	11.75	11.50	12.50	13.25	13.75	13.25
1908.....	7.75	8.75	8.75	8.50	8.25	8.25	8.25	9.00	9.50	9.50	10.50	11.75
1907.....	15.25	15.00	15.75	16.00	15.75	15.50	15.50	15.25	14.50	14.00	11.60	7.75
1906.....	.....	.....	12.50	11.75	11.25	11.25	11.25	11.50	12.40	12.25	12.40	14.75

No. 1 Cast, Pittsburgh, 1917-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$16.00	$15.60	$15.60	$16.00	$15.75	$15.10	$15.00	$15.00	$15.00	$14.70	$14.50	$14.50
1926.....	17.40	16.86	17.00	17.00	16.25	15.85	15.60	16.85	16.40	16.10	16.00	16.00
1925.....	19.50	18.85	18.35	17.80	17.00	17.00	17.00	17.10	17.50	17.40	17.75	17.50
1924.....	21.30	20.85	19.60	18.35	17.50	17.75	17.70	18.00	18.35	17.70	18.25	18.50
1923.....	22.65	24.50	27.70	27.75	25.60	23.75	21.50	21.20	21.50	19.35	18.50	20.00
1922.....	16.00	16.00	16.40	17.25	18.50	18.70	19.15	19.00	21.75	23.35	23.30	22.50
1921.....	24.50	22.00	21.00	18.25	17.50	16.00	15.00	14.85	16.30	17.50	17.10	16.25
1920.....	32.50	41.50	41.00	39.60	39.00	40.00	38.50	41.50	42.20	40.75	38.00	27.50
1919.....	25.60	21.00	21.00	21.75	21.00	21.00	21.00	24.00	24.50	25.00	28.75	30.50
1918.....	28.00	28.00	28.00	34.00	32.50	32.50	32.50	32.50	32.50	32.50	32.40	32.00
1917.....	20.00	19.75	21.50	23.35	24.60	33.25	34.75	35.00	32.50	28.00	28.50	28.50

No. 1 Cast, Eastern Pennsylvania, 1915-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$17.75	$17.50	$17.50	$17.25	$17.25	$16.75	$16.35	$16.25	$16.25	$16.25	$16.75	$16.75
1926.....	18.35	18.25	18.25	18.25	18.00	17.75	17.80	18.25	18.15	17.75	17.75	17.75
1925.....	20.75	19.35	18.50	18.20	17.10	17.75	17.75	17.75	18.65	18.75	18.75	18.75
1924.....	20.75	20.35	19.25	18.35	17.10	17.90	17.80	18.00	18.40	17.95	18.25	19.50
1923.....	23.30	24.75	28.00	26.85	24.80	22.75	21.00	20.00	20.35	19.70	19.50	20.50
1922.....	16.75	16.50	17.00	17.40	17.90	18.50	18.00	18.00	20.65	23.00	21.90	20.50
1921.....	24.15	23.35	20.50	18.15	17.90	17.50	17.50	16.50	16.50	17.50	18.00	17.50
1920.....	36.50	38.55	40.00	38.00	38.00	37.00	37.20	38.75	39.80	38.00	34.75	28.90
1919.....	28.15	25.00	22.50	22.50	21.50	22.00	23.50	24.65	25.00	25.15	28.00	31.75
1918.....	33.50	34.50	33.90	32.75	33.00	33.75	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	20.75	20.15	22.50	26.75	30.00	34.75	38.35	34.10	32.90	30.00	30.50	32.00
1916.....	17.50	17.50	17.75	18.00	17.75	16.50	16.00	16.00	16.25	16.50	18.50	22.00
1915.....	12.00	12.00	12.50	12.50	12.00	12.25	12.25	13.50	14.50	14.50	15.00	15.60

Market History —

No. 1 Cast, Chicago, 1918-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$18.90	$18.90	$18.50	$18.10	$17.35	$16.65	$16.55	$16.80	$16.80	$16.25	$15.85	$15.70
1926.....	19.40	18.75	18.75	18.65	18.05	18.15	19.55	19.00	18.95	17.90	18.35	18.50
1925.....	22.10	20.15	19.70	18.85	19.00	19.50	19.75	20.30	20.15	19.40	20.90	20.50
1924.....	22.10	22.25	20.80	20.00	19.00	17.75	18.60	19.00	20.25	19.20	19.25	20.75
1923.....	24.30	25.75	28.50	27.55	24.20	23.25	23.25	21.20	21.50	20.40	20.55	21.50
1922.....	14.00	14.50	15.10	16.15	17.40	17.30	17.65	19.70	23.80	24.00	22.90	22.00
1921.....	20.35	21.15	18.10	15.25	15.85	14.90	13.75	13.95	14.50	15.25	15.50	14.00
1920.....	42.50	43.25	42.20	44.10	42.50	41.75	41.20	42.00	39.30	32.75	27.65	22.10
1919.....	26.25	22.05	23.10	23.50	22.35	23.40	20.65	27.75	26.75	28.15	31.10	35.35
1918.....	30.00	30.00	33.00	32.45	30.75	31.00	31.80	33.40	34.00	34.00	32.75	29.00

Rails for Rolling, Chicago, 1908-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$16.00	$16.00	$15.50	$15.85	$15.10	$14.60	$14.60	$15.00	$15.20	$14.70	$13.95	$14.00
1926.....	17.55	16.30	16.50	16.00	14.95	15.10	17.10	17.25	17.25	16.65	16.50	16.50
1925.....	20.95	19.15	18.15	15.85	16.75	18.15	17.45	19.10	19.00	18.55	19.40	18.80
1924.....	18.90	20.00	19.30	17.10	15.30	14.55	15.50	16.00	17.40	17.20	18.20	19.50
1923.....	20.55	22.00	24.90	23.65	21.80	19.40	18.40	17.75	18.30	16.25	15.10	17.00
1922.....	12.50	11.50	12.85	14.25	15.50	15.40	16.00	16.75	19.40	20.50	18.90	18.00
1921.....	15.80	15.90	13.30	12.70	13.25	12.80	12.45	12.70	13.05	14.00	13.90	12.50
1920.....	33.60	34.65	32.60	32.50	31.50	32.35	34.90	38.00	38.50	34.00	24.15	17.40
1919.....	22.30	15.55	16.30	17.95	17.45	19.25	24.70	29.00	25.38	26.80	31.15	31.50
1918.....	35.30	35.00	35.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	27.25	25.65	27.25	31.90	36.80	46.00	46.25	41.90	41.25	36.00	35.70	35.65
1916.....	17.70	17.10	17.20	17.90	17.25	16.25	15.70	15.70	16.90	18.75	24.90	29.50
1915.....	9.50	9.60	10.00	9.85	10.00	10.00	10.10	11.75	13.15	13.25	14.30	16.70
1914.....	11.00	11.20	11.25	11.25	11.25	11.25	11.25	11.25	10.85	10.00	9.50	9.50
1913.....	16.25	15.50	15.00	14.50	14.00	14.00	12.00	12.50	12.00	12.00	12.00	11.50
1912.....	13.00	13.00	12.75	12.75	13.25	13.50	13.25	13.50	14.75	16.00	16.50	16.50
1911.....	13.50	13.50	13.50	13.00	12.75	12.25	12.25	12.50	12.25	12.25	12.00	12.25
1910.....	17.75	17.75	17.50	17.50	17.25	16.50	16.50	15.50	15.75	15.75	15.00	14.00
1909.....	15.80	15.05	12.80	13.20	14.65	15.50	15.55	16.00	17.20	18.00	20.25	17.70
1908.....	12.30	13.00	12.20	12.75	13.20	14.00	14.45	15.60	16.00	15.70	16.95	17.25

Iron Car Wheels, Chicago, 1915-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	$14.95	$15.10	$15.00	$14.85	$14.00	$13.50	$13.80	$14.75	$14.25	$13.50	$13.15	$13.40
1926.....	18.00	16.30	16.70	16.45	15.65	15.40	16.50	16.50	15.75	14.50	14.50	14.60
1925.....	21.00	19.65	17.50	16.85	15.90	17.40	17.15	17.50	17.60	17.25	18.15	18.40
1924.....	20.60	21.25	19.90	17.50	16.60	15.65	16.40	16.90	18.40	17.90	18.60	19.50
1923.....	25.35	26.50	28.50	27.65	24.30	21.50	20.90	19.60	19.60	18.60	17.85	19.00
1922.....	15.25	14.65	15.90	18.15	18.80	18.25	18.90	20.40	23.50	24.75	24.60	23.75
1921.....	21.50	21.40	16.60	14.45	14.50	13.70	12.75	13.70	14.90	16.15	16.25	15.90
1920.....	36.25	38.75	36.15	38.50	38.25	36.00	35.70	38.40	38.80	37.25	33.25	25.80
1919.....	23.20	21.15	20.00	20.40	20.20	22.00	24.40	25.15	23.50	23.60	28.50	29.75
1918.....	30.40	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	27.50
1917.....	19.75	18.30	20.30	23.25	27.20	37.00	36.75	30.70	31.00	25.90	27.50	29.50
1916.....	14.75	14.05	14.05	14.00	13.15	12.50	11.90	12.00	12.25	12.25	15.95	21.00
1915.....	10.00	10.00	10.00	10.00	9.75	9.85	10.30	11.40	11.75	11.75	12.75	14.75

Finished Rolled Material

Per Pound f.o.b.

Tank Plates, Pittsburgh, 1895-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	1.90c	1.85c	1.90c	1.85c	1.85c	1.80c	1.80c	1.80c	1.80c	1.75c	1.75c	1.80c
1926.....	1.90	1.85	1.85	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
1925.....	2.00	2.10	2.10	2.00	2.00	2.00	2.00	1.90	1.80	1.80	1.85	1.90
1924.....	2.50	2.45	2.40	2.35	2.25	2.15	2.10	2.00	1.95	1.80	1.85	1.90
1923.....	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922.....	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921.....	2.65	2.35	2.05	2.15	2.20	2.00	1.85	1.75	1.70	1.60	1.60	1.50
1920.....	3.10	3.70	3.75	3.65	3.50	3.50	3.50	3.50	3.50	3.20	3.00	2.65
1919.....	3.00	3.00	2.90	2.65	2.65	2.65	2.65	2.65	2.55	2.65	2.65	2.70
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	4.25	4.30	5.00	5.45	6.40	7.75	9.45	9.20	7.50	3.25	3.25	3.25
1916.....	2.50	2.55	3.15	3.50	3.50	3.50	3.50	3.75	3.70	3.70	3.90	4.25
1915.....	1.10	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.45	1.70	1.95
1914.....	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.10	1.10
1913.....	1.50	1.50	1.50	1.50	1.50	1.45	1.45	1.45	1.40	1.35	1.30	1.20
1912.....	1.15	1.10	1.10	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911.....	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.30	1.25	1.20	1.10	1.15
1910.....	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909.....	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908.....	1.70	1.70	1.70	1.70	1.70	1.65	1.60	1.60	1.60	1.60	1.60	1.60
1907.....	1.70	1.70	1.70	1.70	1.80	1.80	1.80	1.70	1.70	1.70	1.70	1.70
1906.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.70
1905.....	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.60	1.60	1.60
1904.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.50
1903.....	1.60	1.60	1.75	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1901.....	1.40	1.40	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900.....	2.40	2.20	2.00	1.80	1.60	1.35	1.05	1.10	1.05	1.05	1.35	1.40
1899.....	1.30	1.45	1.75	2.05	2.10	2.30	2.45	2.55	2.85	2.80	2.50	2.30
1898.....	1.00	1.00	0.95	1.00	1.10	1.10	1.10	1.10	1.15	1.10	1.10	1.15
1897.....	1.10	1.10	1.10	1.05	1.05	1.00	1.00	1.00	1.00	1.05	1.00	1.00
1896.....	1.40	1.35	1.30	1.35	1.30	1.25	1.25	1.20	1.15	1.15	1.10	1.10
1895.....	1.15	1.10	1.10	1.15	1.20	1.25	1.60	1.70	1.80	1.70	1.60	1.50

Market History —

Steel Bars, Pittsburgh, 1901-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	1.95c	1.90c	1.90c	1.90c	1.85c	1.85c	1.80c	1.80c	1.80c	1.75c	1.75c	1.80c
1926	2.00	2.00	2.00	2.00	1.95	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.10	2.10	2.10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1924	2.40	2.40	2.40	2.30	2.25	2.20	2.15	2.10	2.05	2.00	2.05	2.10
1923	2.00	2.15	2.30	2.35	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
1922	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921	2.35	2.15	2.00	2.05	2.10	2.05	1.85	1.75	1.65	1.60	1.55	1.50
1920	3.10	3.85	3.85	3.65	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.35
1919	2.70	2.70	2.60	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.45	2.90
1918	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
1917	3.20	3.20	3.45	3.65	3.65	4.00	4.70	4.75	4.25	2.90	2.90	2.90
1916	2.40	2.40	2.65	3.00	3.00	2.85	2.75	2.55	2.60	2.70	2.95	3.15
1915	1.10	1.10	1.15	1.20	1.20	1.20	1.30	1.35	1.30	1.45	1.70	1.90
1914	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.15	1.10	1.10
1913	1.45	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.35	1.25
1912	1.15	1.15	1.10	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.40	1.40
1911	1.40	1.40	1.40	1.40	1.40	1.25	1.25	1.20	1.15	1.10	1.10	1.10
1910	1.50	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.40	1.40	1.40	1.40
1909	1.40	1.30	1.20	1.15	1.20	1.20	1.25	1.35	1.40	1.40	1.45	1.50
1908	1.60	1.60	1.60	1.60	1.60	1.50	1.40	1.40	1.40	1.40	1.40	1.40
1907	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1906	2.00	1.75	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.55	1.60
1905	1.45	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.70	1.80	1.95
1904	1.30	1.30	1.35	1.35	1.30	1.30	1.30	1.30	1.35	1.30	1.30	1.40
1903	1.65	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.35	1.30
1902	1.60	1.50	1.50	1.65	1.80	1.80	1.70	1.75	1.75	1.70	1.60	1.70
1901	1.20	1.25	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.60

Rail Steel Bars, Chicago, 1918-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	1.90c	1.90c	1.90c	1.90c	1.90c	1.90c	1.90c	1.90c	1.90c	1.80c	1.80c	1.80c
1926	2.00	2.00	2.00	2.00	2.00	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.03	2.13	2.07	2.00	2.10	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1924	2.30	2.30	2.30	2.30	2.20	2.15	2.10	2.05	2.05	2.00	2.00	2.00
1923	2.00	2.00	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
1922	1.60	1.50	1.50	1.55	1.65	1.65	1.70	1.80	1.95	2.00	2.00	2.00
1921	2.50	2.50	2.50	2.15	2.00	2.00	1.95	1.85	1.85	1.75	1.70	1.65
1920	2.90	3.20	3.35	3.70	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
1919	2.80	2.80	2.80	2.55	2.45	2.45	2.45	2.55	2.55	2.55	2.75	2.85
1918	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Structural Shapes, Pittsburgh, 1895-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	1.95c	1.90c	1.90c	1.90c	1.85c	1.80c	1.80c	1.80c	1.80c	1.75c	1.75c	1.80c
1926	1.90	1.90	1.90	1.90	1.90	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.10	2.10	2.10	2.00	2.00	2.00	2.00	2.00	1.90	1.90	2.00	1.95
1924	2.50	2.50	2.50	2.35	2.25	2.20	2.15	2.05	2.00	2.00	2.00	2.00
1923	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	1.95
1921	2.45	2.25	2.10	2.15	2.20	2.05	1.90	1.75	1.70	1.60	1.60	1.50
1920	2.65	3.15	3.25	3.25	3.25	3.25	3.25	3.15	3.10	3.10	3.00	2.45
1919	2.80	2.80	2.70	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.50
1918	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1917	3.10	3.25	3.45	3.70	4.00	4.00	4.50	4.50	3.75	3.00	3.00	3.00
1916	1.85	2.05	2.40	2.50	2.50	2.50	2.50	2.50	2.60	2.70	2.90	3.00
1915	1.10	1.10	1.15	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.65	1.75
1914	1.20	1.20	1.20	1.20	1.15	1.10	1.10	1.15	1.20	1.15	1.10	1.05
1913	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.35	1.30	1.25
1912	1.15	1.15	1.15	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.30	1.20	1.15
1910	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908	1.70	1.70	1.70	1.70	1.70	1.65	1.65	1.60	1.60	1.60	1.60	1.60
1907	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1906	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1905	1.50	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.70	1.70	1.70	1.70
1904	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.40
1903	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902	1.60	1.60	1.70	1.85	2.00	2.25	2.25	2.35	2.25	2.15	2.10	2.00
1901	1.50	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900	2.25	2.25	2.25	2.25	2.25	2.05	1.90	1.75	1.70	1.70	1.70	1.70
1899	1.30	1.30	1.40	1.50	1.50	1.75	1.95	2.05	2.25	2.25	2.25	2.25
1898	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.20	1.20	1.20
1897	1.55	1.55	1.55	1.55	1.30	1.05	1.00	1.00	1.00	1.10	1.10	1.10
1896	1.45	1.50	1.45	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.50	1.45
1895	1.25	1.20	1.20	1.20	1.20	1.35	1.50	1.60	1.65	1.60	1.60	1.55

Bar Iron, Chicago, 1907-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	1.90c	1.85c	1.90c
1926	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.00	2.00	2.10	2.10	2.10	2.05	1.95	1.90	1.90	1.90	2.00	2.00
1924	2.40	2.40	2.40	2.35	2.30	2.25	2.20	2.15	2.15	2.10	2.10	2.00
1923	2.35	2.45	2.55	2.60	2.60	2.60	2.55	2.50	2.40	2.40	2.40	2.40
1922	1.60	1.60	1.60	1.65	1.65	1.75	1.80	2.00	2.25	2.50	2.50	2.35
1921	2.75	2.65	2.65	2.50	2.45	2.25	1.95	1.75	1.75	1.75	1.70	1.65
1920	3.15	3.45	3.50	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.50
1919	3.15	2.95	2.85	2.55	2.50	2.55	2.65	2.65	2.65	2.70	2.75	2.75
1918	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917	3.00	3.00	3.00	3.20	3.40	4.00	4.50	4.50	4.50	4.50	4.00	4.00
1916	1.85	1.90	2.20	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.50	2.60
1915	0.95	1.05	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.50	1.70
1914	1.15	1.20	1.15	1.15	1.10	1.10	1.05	1.05	1.05	1.05	0.95	0.95
1913	1.60	1.60	1.60	1.55	1.55	1.55	1.50	1.45	1.35	1.25	1.15	1.15
1912	1.15	1.15	1.15	1.15	1.25	1.25	1.35	1.40	1.45	1.50	1.55	1.55
1911	1.30	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.15	1.15	1.15
1910	1.60	1.60	1.55	1.55	1.50	1.45	1.40	1.40	1.40	1.35	1.35	1.30
1909	1.50	1.50	1.40	1.30	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908	1.60	1.55	1.55	1.55	1.55	1.55	1.50	1.50	1.50	1.50	1.50	1.50
1907	1.80	1.80	1.80	1.80	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

Market History —

No. 24 Black Sheets, Pittsburgh, 1907-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	2.95c	2.90c	2.90c	2.80c	2.90c	3.00c	3.00c	3.00c	3.00c	2.95c	2.80c	2.75c
1926	3.35	3.35	3.25	3.25	3.20	3.10	3.10	3.10	*3.05	3.05	3.10	3.10
1925	3.50	3.50	3.40	3.35	3.25	3.15	3.15	3.15	3.10	3.10	3.25	3.35
1924	3.75	3.75	3.75	3.70	3.65	3.65	3.60	3.50	3.45	3.40	3.45	3.50
1923	3.35	3.35	3.55	3.85	3.85	3.85	3.85	3.85	3.75	3.75	3.75	3.75
1922	3.00	3.00	3.00	3.10	3.15	3.15	3.15	3.25	3.40	3.50	3.35	3.30
1921	4.35	4.20	3.90	3.90	4.00	3.90	3.35	3.05	2.80	3.00	2.95	3.00
1920	5.00	6.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00	6.05	4.45
1919	4.70	4.70	4.60	4.35	4.35	4.30	4.30	4.35	4.35	4.35	4.35	4.35
1918	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1917	4.55	4.55	5.05	5.75	7.00	8.15	9.00	9.00	8.75	7.75	5.30	5.00
1916	2.55	2.60	2.75	2.90	2.95	2.90	2.90	2.75	2.85	3.20	3.65	4.45
1915	1.80	1.80	1.80	1.80	1.80	1.80	1.75	1.85	1.90	2.05	2.20	2.50
1914	1.85	1.95	1.95	1.90	1.85	1.80	1.80	1.90	1.95	1.95	1.90	1.80
1913	2.30	2.35	2.35	2.35	2.35	2.30	2.25	2.20	2.10	2.00	1.95	1.90
1912	1.90	1.85	1.80	1.85	1.95	1.95	2.00	2.05	2.10	2.20	2.25	2.25
1911	2.20	2.20	2.20	2.15	2.15	2.00	2.00	1.95	1.90	1.85	1.85	1.90
1910	2.40	2.40	2.40	2.35	2.30	2.25	2.20	2.20	2.15	2.15	2.15	2.15
1909	2.40	2.40	2.30	2.20	2.20	2.20	2.20	2.20	2.20	2.30	2.40	2.40
1908	2.55	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1907	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

*No. 28 gage before Sept. 1, 1926.

No. 10 Blue Annealed Sheets, Pittsburgh, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	2.25c	2.20c	2.20c	2.20c	2.25c	2.25c	2.25c	2.25c	2.25c	2.15c	2.10c	2.10c
1926	2.50	2.50	2.50	2.50	2.45	2.35	2.30	2.30	2.30	2.35	2.40	2.40
1925	2.70	2.70	2.65	2.55	2.45	2.30	2.30	2.30	2.25	2.25	2.40	2.50
1924	2.95	2.90	2.95	2.80	2.80	2.80	2.75	2.70	2.70	2.60	2.60	2.70
1923	2.50	2.50	2.70	2.80	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.90
1922	2.25	2.25	2.25	2.35	2.40	2.40	2.40	2.45	2.50	2.60	2.60	2.50
1921	3.55	3.55	3.05	2.95	3.10	3.00	2.55	2.40	2.30	2.50	2.40	2.25
1920	4.05	5.50	5.50	4.85	5.00	5.00	5.00	5.00	5.00	5.00	4.95	3.65
1919	3.90	3.90	3.80	3.55	3.55	3.50	3.50	3.55	3.55	3.55	3.55	3.55
1918	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1917	4.10	4.35	4.70	5.35	6.65	8.00	8.50	8.50	8.50	7.85	4.75	4.25
1916	2.45	2.60	2.85	3.00	3.05	3.10	3.00	3.00	2.95	3.15	3.30	3.90
1915	1.30	1.30	1.30	1.30	1.35	1.35	1.35	1.35	1.50	1.60	1.85	2.25
1914	1.35	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.40	1.40	1.40	1.35
1913	1.70	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.45	1.40

No. 24 Galvanized Sheets, Pittsburgh, 1903-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	3.80c	3.70c	3.70c	3.65c	3.80c	3.80c	3.85c	3.85c	3.85c	3.80c	3.70c	3.60c
1926	4.60	4.60	4.60	4.60	4.55	4.30	4.30	4.30	*3.95	3.90	3.95	3.95
1925	4.75	4.75	4.70	4.55	4.35	4.20	4.20	4.20	4.20	4.25	4.50	4.60
1924	4.95	4.90	4.90	4.85	4.80	4.80	4.70	4.60	4.60	4.60	4.60	4.60
1923	4.35	4.35	4.65	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.85	4.90
1922	4.00	4.00	4.00	4.10	4.15	4.15	4.15	4.25	4.40	4.50	4.35	4.35
1921	5.70	5.50	5.05	4.90	5.00	4.90	4.35	4.05	3.80	4.00	3.95	4.00
1920	6.35	7.00	7.25	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.35	5.85
1919	6.05	6.05	5.95	5.70	5.70	5.65	5.65	5.70	5.70	5.70	5.70	5.70
1918	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1917	6.55	6.80	6.80	7.55	8.80	9.95	10.25	10.25	9.70	8.80	6.50	6.25
1916	4.75	4.75	4.80	4.85	4.85	4.80	4.35	4.25	4.20	4.45	5.05	6.25
1915	2.75	3.00	3.40	3.30	3.40	4.45	4.55	3.95	3.65	3.50	3.90	4.75
1914	2.85	2.95	2.95	2.90	2.80	2.75	2.75	2.85	2.95	2.95	2.85	2.80
1913	3.45	3.50	3.50	3.50	3.40	3.40	3.30	3.25	3.15	3.05	2.95	2.85
1912	3.20	3.20	3.00	3.00	3.10	3.10	3.10	3.30	3.50	3.50	3.50	3.50
1911	3.20	3.20	3.20	3.20	3.20	3.00	3.00	3.00	2.80	3.00	3.00	3.20
1910	3.70	3.70	3.70	3.70	3.50	3.20	3.20	3.20	3.20	3.20	3.20	3.20
1909	3.40	3.30	3.40	3.40	3.40	3.50	3.50	3.50	3.60	3.60	3.70	3.70
1908	3.70	3.70	3.70	3.60	3.50	3.50	3.50	3.50	3.30	3.30	3.20	3.20
1907	4.00	4.00	4.00	3.80	3.80	3.80	3.70	3.70	3.60	3.60	3.50	3.50
1906	3.60	3.60	3.70	3.80	3.80	3.80	3.80	3.90	3.80	4.00	4.00	4.00
1905	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1904	3.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.50
1903	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.50	3.50	3.50

*No. 28 gage before Sept. 1, 1926.

Tin Plate, Pittsburgh, 1903-1927

Per Base Box, 100 lbs., Pittsburgh

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$5.50	$5.50	$5.50	$5.50	$5.50	$5.45	$5.50	$5.50	$5.50	$5.30	$5.30	$5.25
1926	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	$550	5.50
1925	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1924	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1923	4.75	4.75	4.95	4.95	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1922	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
1921	7.00	7.00	7.00	6.65	6.25	6.25	5.65	5.25	5.15	5.00	4.80	4.75
1920	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1919	7.35	7.35	7.25	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1918	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75
1917	6.90	7.00	7.50	7.50	7.90	9.25	10.00	10.00	10.00	10.00	8.20	7.75
1916	3.75	3.75	4.15	4.70	5.15	5.55	5.80	6.00	5.60	5.75	6.05	6.50
1915	3.10	3.10	3.10	3.20	3.20	3.10	3.10	3.10	3.10	3.10	3.35	3.60
1914	3.40	3.40	3.40	3.40	3.40	3.30	3.25	3.45	3.55	3.35	3.15	3.20
1913	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.55	3.50	3.40
1912	3.40	3.40	3.50	3.50	3.50	3.50	3.50	3.70	3.70	3.70	3.70	3.60
1911	3.70	3.70	3.70	3.60	3.60	3.60	3.60	3.50	3.50	3.40	3.40	3.40
1910	3.50	3.50	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
1909	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.50	3.50	3.50
1908	3.60	3.60	3.60	3.60	3.60	3.50	3.50	3.50	3.50	3.50	3.50	3.40
1907	3.90	3.90	3.90	3.90	3.80	3.80	3.70	3.70	3.70	3.60	3.60	3.60
1906	3.50	3.50	3.50	3.60	3.70	3.70	3.80	3.90	3.90	3.90	4.00	4.00
1905	3.50	3.50	3.50	3.50	3.50	3.40	3.40	3.40	3.30	3.30	3.40	3.50
1904	3.40	3.40	3.30	3.30	3.20	3.20	3.20	3.10	3.30	3.40	3.50	3.50
1903	3.80	3.80	3.90	3.90	3.80	3.80	3.70	3.70	3.60	3.60	3.60	3.50

Market History —

Cold Finished Steel Bars, Pittsburgh, 1920-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.35c	2.35c	2.40c	2.40c	2.40c	2.35c	2.30c	2.30c	2.20c	2.15c	2.10c	2.10c
1926.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.45	2.40	2.40
1925.....	2.80	2.80	2.75	2.70	2.70	2.60	2.55	2.50	2.50	2.45	2.50	2.50
1924.....	3.00	3.00	3.00	3.00	3.00	2.90	2.85	2.80	2.75	2.70	2.70	2.80
1923.....	2.50	2.65	2.85	3.00	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.90
1922.....	2.00	1.90	1.85	1.85	2.00	2.00	2.05	2.15	2.50	2.50	2.50	2.50
1921.....	3.60	3.60	3.10	3.05	3.10	3.00	2.75	2.50	2.40	2.25	2.15	2.00
1920.....	3.65	3.85	4.50	5.25	4.40	4.50	4.10	4.55	4.25	4.10	4.00	3.60

Plain Wire, Pittsburgh, 1915-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.50c	2.45c	2.40c	2.40c	2.40c	2.40c	2.40c	2.40c	2.40c	2.40c	2.40c	2.40c
1926.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925.....	2.60	2.60	2.60	2.55	2.50	2.45	2.50	2.50	2.50	2.50	2.50	2.50
1924.....	2.75	2.75	2.75	2.75	2.70	2.65	2.60	2.60	2.55	2.50	2.50	2.60
1923.....	2.45	2.60	2.65	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922.....	2.25	2.20	2.25	2.25	2.25	2.25	2.25	2.25	2.40	2.45	2.45	2.45
1921.....	3.25	3.20	3.00	3.00	3.00	2.75	2.50	2.50	2.60	2.60	2.60	2.25
1920.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.20	3.25	3.25	3.25
1919.....	3.25	3.25	3.20	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.15	3.25
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	2.95	2.95	3.10	3.20	3.45	3.60	3.95	3.95	3.95	3.85	3.25	3.25
1916.....	1.95	2.10	2.25	2.25	2.45	2.45	2.45	2.55	2.55	2.60	2.80	2.95
1915.....	1.30	1.35	1.40	1.40	1.35	1.35	1.40	1.40	1.55	1.60	1.70	1.90

Wire Nails, Pittsburgh, 1907-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.65c	2.60c	2.55c	2.55c	2.50c	2.55c	2.55c	2.55c	2.55c	2.55c	2.50c	2.50c
1926.....	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
1925.....	2.85	2.85	2.85	2.20	2.25	2.75	2.65	2.65	2.65	2.65	2.65	2.65
1924.....	3.00	3.00	3.00	3.00	2.95	2.90	2.85	2.85	2.80	2.75	2.75	2.85
1923.....	2.70	2.75	2.90	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1922.....	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.65	2.70	2.70	2.70
1921.....	3.25	3.00	3.00	3.25	3.25	3.00	2.75	2.75	2.90	2.90	2.90	2.50
1920.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1919.....	3.50	3.50	3.45	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.45	3.50
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.15	3.20	3.50	3.65	4.00	4.00	4.00	3.90	3.50	3.50
1916.....	2.15	2.20	2.40	2.40	2.50	2.50	2.50	2.60	2.60	2.65	2.85	3.00
1915.....	1.50	1.55	1.60	1.60	1.55	1.55	1.60	1.60	1.70	1.75	1.85	2.00
1914.....	1.55	1.60	1.60	1.60	1.60	1.55	1.55	1.55	1.60	1.60	1.60	1.50
1913.....	1.75	1.75	1.75	1.80	1.80	1.80	1.75	1.70	1.65	1.60	1.60	1.60
1912.....	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.65	1.70	1.70	1.75	1.75
1911.....	1.70	1.75	1.80	1.80	1.75	1.80	1.70	1.70	1.65	1.65	1.55	1.55
1910.....	1.85	1.85	1.85	1.85	1.80	1.80	1.70	1.70	1.70	1.70	1.65	1.70
1909.....	1.95	1.95	1.95	1.95	1.60	1.70	1.70	1.80	1.80	1.80	1.80	1.85
1908.....	2.05	2.05	2.05	2.05	2.05	2.00	1.95	1.95	1.95	1.95	1.95	1.95
1907.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.05	2.05	2.05

Cold Rolled Strip, Pittsburgh, 1910-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	3.10c	2.90c	2.95c	3.00c	3.00c	3.25c	3.25c	3.25c	3.15c	2.95c	2.95c	3.00c
1926.....	3.90	3.90	3.90	3.85	3.75	3.70	3.65	3.50	3.50	3.50	3.25	3.25
1925.....	4.10	4.15	4.05	4.00	3.85	3.65	3.75	3.75	3.75	3.75	3.90	3.90
1924.....	5.00	4.80	4.80	4.75	4.50	4.50	4.35	4.20	4.00	4.00	4.00	4.15
1923.....	4.50	4.65	4.80	5.15	5.25	5.25	5.00	5.00	5.00	5.00	5.00	4.75
1922.....	3.50	3.50	3.50	3.60	3.70	3.95	4.00	4.00	4.25	4.50	4.50	4.50
1921.....	6.25	6.25	5.65	5.50	5.50	5.00	4.40	3.90	3.75	3.75	3.80	3.75
1920.....	5.65	7.00	8.80	8.50	8.50	8.50	8.50	8.50	7.35	8.50	8.00	6.85
1919.....	6.25	6.25	6.10	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65
1918.....	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1917.....	6.50	6.50	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.50	6.50
1916.....	4.25	4.65	5.50	6.00	6.00	6.00	6.00	6.00	6.00	6.50	6.50	6.50
1915.....	2.75	2.75	2.75	2.75	2.75	2.85	2.85	3.00	3.10	3.25	3.50	3.75
1914.....	3.05	3.05	3.05	3.05	3.05	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1913.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.05
1912.....	2.95	2.95	2.95	2.95	3.00	3.05	3.05	3.05	3.05	3.15	3.20	3.25
1911.....	2.95	2.95	3.25	3.25	3.25	2.95	2.95	2.95	2.95	2.95	2.95	2.95
1910.....	.....	.....	.....	.....	.....	.....	2.95	2.95	2.95	2.95	2.95	2.95

Hot Rolled Strip, Pittsburgh, 1917-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.20c	2.10c	2.10c	2.10c	2.10c	2.10c	2.10c	2.10c	2.10c	2.10c	2.00c	1.90c
1926.....	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
1925.....	2.35	2.40	2.35	2.20	2.20	2.20	2.20	2.20	2.20	2.25	2.30	2.30
1924.....	3.00	2.95	2.85	2.75	2.60	2.55	2.50	2.50	2.45	2.35	2.25	2.35
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.20	3.15	3.10	3.00	3.00	2.75
1922.....	2.00	1.80	1.80	1.95	2.05	2.35	2.50	2.50	2.75	2.90	2.90	2.80
1921.....	3.30	3.30	2.85	2.75	2.75	2.70	2.50	2.30	2.15	2.15	2.25	2.00
1920.....	3.70	4.80	5.25	5.45	5.50	5.50	5.50	5.50	5.50	5.50	5.00	3.90
1919.....	3.80	3.55	3.30	3.25	3.05	3.05	3.10	3.30	3.30	3.30	*3.30	*3.30
1918.....	4.50	4.50	4.50	4.50	4.25	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	.....	.....	.....	.....	.....	7.25	7.25	7.25	7.00	7.00	5.25	4.50

*First quarter 1920 delivery.

Market History —

Hoops, Pittsburgh, 1908-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.40c	2.25c	2.30c	2.30c	2.30c	2.30c	2.30c	2.30c	2.30c	2.25c	2.20c	2.15c
1926.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925.....	2.45	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.45	2.50	2.50
1924.....	3.00	3.00	2.85	2.75	2.75	2.70	2.60	2.60	2.55	2.50	2.50	2.50
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922.....	1.95	1.85	1.80	1.95	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921.....	3.05	3.05	2.70	2.75	2.75	2.70	2.45	2.40	2.30	2.25	2.20	2.15
1920.....	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919.....	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.50	3.50	3.90	4.10	4.70	5.75	6.00	6.00	6.00	6.00	4.60	3.50
1916.....	2.00	2.25	2.55	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.25	3.25
1915.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.30	1.40	1.50	1.75	1.95
1914.....	1.40	1.30	1.30	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
1913.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.50	1.40
1912.....	1.30	1.25	1.25	1.25	1.25	1.25	1.35	1.40	1.40	1.45	1.50	1.50
1911.....	1.50	1.50	1.45	1.45	1.45	1.45	1.40	1.40	1.35	1.35	1.30	1.30
1910.....	1.60	1.60	1.60	1.60	1.50	1.55	1.55	1.55	1.50	1.50	1.50	1.50
1909.....	1.80	1.75	1.60	1.60	1.50	1.40	1.40	1.40	1.50	1.50	1.50	1.55
1908.....	2.00	2.00	2.00	2.00	2.00	1.90	1.80	1.80	1.80	1.80	1.80	1.80

Bands, Pittsburgh, 1916-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.40c	2.25c	2.30c	2.30c	2.30c	2.30c	2.30c	2.30c	2.30c	2.25c	2.20c	2.15c
1926.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925.....	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.45	2.50	2.50
1924.....	3.00	3.00	2.85	2.75	2.75	2.70	2.60	2.60	2.40	2.40	2.40	2.40
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922.....	1.75	1.75	1.70	1.85	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921.....	3.05	3.05	2.70	2.75	2.75	2.70	2.35	2.20	2.20	2.25	2.15	2.00
1920.....	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919.....	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918.....	2.90	2.90	2.90	2.90	3.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.35	3.35	3.60	5.50	6.00	6.00	6.00	6.00	4.30	2.90
1916.....	1.85	2.05	2.35	2.50	2.50	2.50	2.50	2.60	2.60	2.60	2.75	2.90

Angle Bars, Chicago, 1914-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c
1926.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1925.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1924.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1923.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922.....	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.50	2.75	2.75	2.75
1921.....	2.75	2.75	2.75	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.55
1920.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1919.....	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.15
1917.....	2.25	2.25	2.35	2.75	2.95	3.25	3.45	3.25	3.25	3.25	3.25	3.25
1916.....	1.50	1.50	1.50	1.50	1.90	2.00	2.00	2.00	2.00	2.15	2.25	2.25
1915.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
1914.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

Tie Plates, Chicago, 1915-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	2.35c	2.35c	2.35c	2.35c	2.35c	2.35c	2.35c	2.35c	2.35c	2.35c	2.25c	2.25c
1926.....	2.30	2.25	2.25	2.25	2.25	2.25	2.25	2.30	2.35	2.35	2.35	2.35
1925.....	2.35	2.45	2.45	2.40	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
1924.....	2.60	2.60	2.60	2.60	2.60	2.60	2.55	2.45	2.45	2.35	2.35	2.35
1923.....	2.40	2.45	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
1922.....	1.90	1.85	1.75	1.80	1.85	1.85	1.85	2.00	2.20	2.35	2.35	2.35
1921.....	3.00	3.00	3.00	2.75	2.50	2.50	2.40	2.15	2.00	2.00	2.00	1.90
1920.....	2.75	2.75	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.00	3.00	3.00
1919.....	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	2.75	2.75	2.90	3.00	3.00	3.00	3.40	3.50	3.50	3.50	3.50	3.45
1916.....	1.80	2.05	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.75
1915.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.50	1.70	1.80

Track Bolts, Chicago, 1914-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927.....	3.90c	3.90c	3.90c	3.90c	3.90c	3.90c	3.90c	3.90c	3.90c	3.80c	3.80c	3.80c
1926.....	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1925.....	3.90	4.00	4.00	4.00	3.95	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1924.....	4.10	4.10	4.10	4.10	4.10	4.10	3.90	3.80	3.80	3.80	3.80	3.80
1923.....	3.90	4.05	4.15	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1922.....	3.60	3.50	3.50	3.60	3.90	3.90	3.60	3.60	3.80	3.85	3.85	3.85
1921.....	5.00	5.00	5.00	4.85	4.75	4.45	4.40	4.15	3.65	3.65	3.65	3.60
1920.....	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.75	4.95	5.00	5.00	5.00
1919.....	4.90	4.90	4.90	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
1918.....	4.90	4.85	5.05	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
1917.....	4.25	4.50	4.50	4.55	5.00	5.05	5.55	5.25	5.25	5.25	5.25	5.15
1916.....	2.60	2.65	3.20	3.25	3.25	3.25	3.25	3.25	3.25	3.60	4.20	4.25
1915.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.10	2.10	2.35	2.50
1914.....	2.05	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Market History —

Railroad Spikes, Pittsburgh, 1916-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c	2.80c
1926	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
1925	2.90	2.90	2.85	2.80	2.80	2.80	2.80	2.75	2.75	2.80	2.80	2.80
1924	3.05	3.05	3.05	3.00	2.95	2.90	2.80	2.80	2.75	2.70	2.75	2.80
1923	2.85	2.90	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.05
1922	2.25	2.15	2.05	2.20	2.25	2.30	2.25	2.30	2.80	2.80	2.75	2.75
1921	3.65	3.65	3.30	3.30	3.25	3.25	3.00	2.75	2.45	2.35	2.30	2.25
1920	3.45	3.70	3.95	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.75
1919	3.65	3.65	3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
1918	4.00	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1917	3.40	3.40	3.50	3.65	3.90	4.20	4.70	6.20	6.50	6.15	5.00	4.75
1916	2.15	2.25	2.50	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	3.25

Structural Rivets, Pittsburgh, 1913-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	2.35c	2.30c	2.30c	2.75c	2.75c	2.75c	2.75c	2.85c	2.85c	2.75c	2.75c	2.75c
1926	2.55	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925	2.60	2.55	2.50	2.50	2.45	2.40	2.45	2.40	2.40	2.40	2.60	2.60
1924	2.85	2.75	2.75	2.65	2.60	2.55	2.50	2.50	2.55	2.60	2.60	2.60
1923	3.00	3.00	3.25	3.25	3.25	3.25	3.15	3.00	3.00	3.00	2.75	2.90
1922	2.25	2.00	2.00	2.05	2.20	2.35	2.40	2.45	3.00	3.00	3.00	3.00
1921	4.15	3.90	3.70	3.60	3.30	3.00	2.70	2.35	2.30	2.40	2.30	2.30
1920	4.15	4.40	4.50	4.50	4.50	4.50	4.50	4.50	4.60	4.75	4.75	4.50
1919	4.40	4.20	4.20	3.70	3.70	3.70	3.70	3.90	3.90	3.90	4.00	4.05
1918	4.65	4.65	4.65	4.65	4.60	4.40	4.40	4.40	4.40	4.40	4.40	4.40
1917	4.25	4.25	4.50	4.75	5.05	5.25	5.25	5.25	5.25	5.25	5.00	4.65
1916	2.60	2.75	3.10	3.35	3.90	4.25	4.05	4.00	4.00	4.00	4.10	4.25
1915	1.45	1.45	1.45	1.45	1.45	1.50	1.50	1.50	1.60	1.75	2.30	2.45
1914	1.60	1.60	1.60	1.60	1.60	1.55	1.50	1.50	1.55	1.50	1.45	1.45
1913	2.20	2.20	2.20	2.20	2.15	2.15	2.10	2.00	2.00	1.90	1.80	1.75

Cast Iron Pipe, New York, 1918-1927

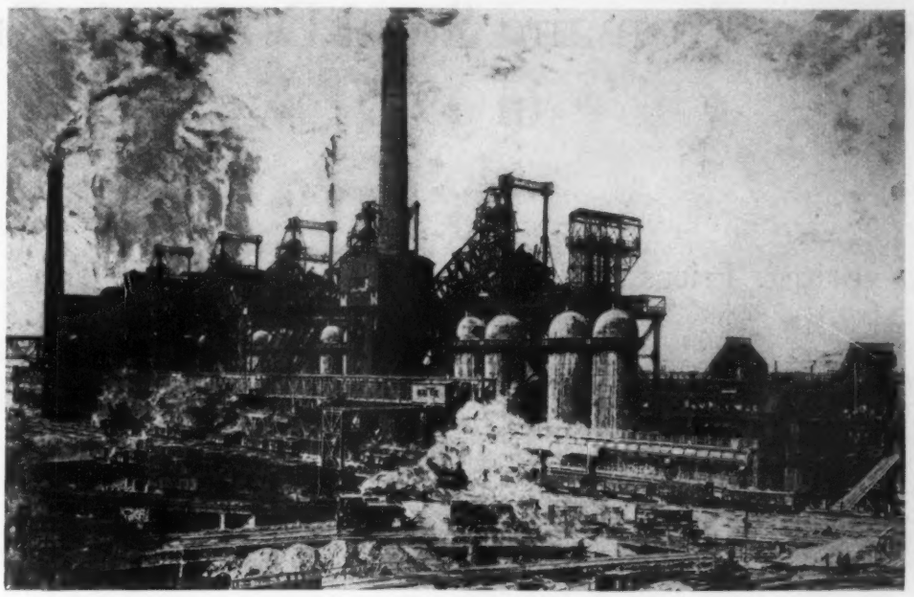
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$49.50	$49.50	$49.50	$49.50	$48.60	$47.95	$46.00	$44.00	$38.25	$36.90	$37.25	$37.25
1926	51.50	51.50	51.50	52.75	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50
1925	61.05	61.05	60.05	58.15	58.05	57.05	57.05	57.05	56.50	57.05	57.05	57.05
1924	66.10	66.10	66.10	66.10	66.10	65.10	65.10	64.10	64.10	64.10	62.10	60.60
1923	56.50	57.30	58.40	58.70	59.00	59.00	59.00	59.20	63.60	63.60	62.80	66.60
1922	47.30	47.30	47.60	48.80	48.80	49.80	53.30	54.50	55.30	55.30	55.30	55.30
1921	63.30	63.30	63.30	63.30	61.30	52.70	48.55	47.05	45.30	47.55	47.30	47.30
1920	67.30	70.30	71.30	73.30	76.30	76.30	76.30	76.30	77.20	77.20	77.20	77.20
1919	66.20	62.70	61.65	57.70	56.70	52.70	52.70	53.10	54.30	56.70	58.30	61.30
1918	55.35	55.35	55.35	55.35	56.55	61.35	62.30	62.50	62.70	67.50	67.70	67.70

Cast Iron Pipe, Chicago, 1918-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$45.70	$43.70	$44.00	$44.20	$43.20	$42.80	$42.20	$38.95	$36.20	$34.30	$35.30	$35.30
1926	48.70	49.20	49.20	49.20	49.45	48.95	47.45	47.45	47.80	47.20	47.20	47.20
1925	49.00	50.20	48.20	46.10	46.95	47.95	48.20	49.20	49.45	49.20	50.20	50.20
1924	56.00	57.20	57.20	56.95	55.40	55.20	52.20	52.70	52.20	50.00	48.00	47.00
1923	51.20	53.20	53.70	55.20	57.20	57.20	59.20	60.45	59.20	57.95	56.85	59.20
1922	41.60	42.10	43.00	43.85	44.70	46.60	45.55	45.20	47.85	52.20	51.20	51.20
1921	64.10	64.10	64.10	64.10	64.10	51.50	47.60	44.35	42.90	42.60	42.60	42.60
1920	67.55	71.30	72.80	74.40	76.80	76.80	76.80	76.80	81.50	83.10	83.10	83.10
1919	64.30	61.80	60.55	56.80	54.80	51.80	52.60	54.80	55.80	59.80	59.80	63.80
1918	54.30	54.30	54.30	54.30	55.50	60.80	62.05	61.85	61.80	66.80	66.80	66.80

Cast Iron Pipe, Birmingham, 1918-1927

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1927	$36.00	$36.00	$36.50	$36.00	$36.50	$34.80	$34.00	$30.75	$29.80	$28.75	$29.00	$29.00
1926	42.00	41.25	40.24	40.00	50.00	40.00	40.00	40.00	39.40	40.00	39.00	38.00
1925	40.00	40.00	40.00	39.60	38.50	40.00	40.00	41.00	41.00	41.75	42.00	42.00
1924	46.80	47.50	48.00	48.00	48.00	48.00	47.00	47.00	45.00	44.40	46.00	40.00
1923	43.00	45.00	45.50	46.75	49.00	49.00	49.00	49.00	49.00	49.00	49.00	51.00
1922	35.00	34.00	33.00	34.15	34.70	37.00	37.00	37.30	40.00	43.00	43.00	43.00
1921	55.00	55.00	55.00	55.00	55.00	42.50	40 00	39.50	38.00	36.50	32.50	35.00
1920	60.00	64.50	66.00	67.00	70.00	70.00	70 00	70.00	72.40	74.00	74.00	74.00
1919	58.75	55.00	54.50	53.00	52.00	48.00	48.00	48.00	48.00	50.00	53.00	56.70
1918	49.00	49.00	49.00	49.00	50.20	55.00	55.00	55.00	55.00	60.00	60.00	60.05



Blast Furnace Plant of the Bochumer Verein, of the Vereinigte Stahlwerke, A. G.—Germany

European Market Reviews for 1927

Reports by Iron Trade Review
Staff Correspondents

Great Britain
Italy

Belgium and Luxemburg
Germany

France
Eastern Europe

European Iron and Steel Domestic Prices in 1927

At Works or Furnace

British Prices in Pounds Sterling Per Gross Ton

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
Foundry No. 3 pig iron, Silicon 2.50-3.00	4. 5.6	4. 4.3	4. 1.3	4. 0.0	3.15.0	3.10.0	3.11.0	3. 8.9	3. 7.6	3. 7.6	3. 6.9	3. 5.0
Basic pig iron	5. 1.3	4.16.0	4.16.0	4.16.0	4.16.0	4.16.0	4.16.0	.....	.....	.....	.....	.....
Furnace coke	1. 5.0	1. 5.0	1. 5.9	1. 4.9	1. 2.6	1. 1.3	0.13.6	0.12.0	0.12.6	0.13.0	0.13.0	0.13.0
Billets	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	5.19.0	5.15.0	5.15.0	5.15.0	5.15.0	5.15.0
Standard rails	8. 0.0	8. 0.0	8 .0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0
Merchant bars	8.15.0	8.15.0	8.15.0	8.11.3	8.10.0	8. 2.6	8. 0.0	8. 0.0	7.12.6	7.10.0	7.10.0	7.10.0
Shapes	7.15.0	7.15.0	7.15.0	7.15.3	7.14.0	7.12.6	7.12.6	7.12.6	7. 8.9	7.12.6	7.12.6	7.12.6
Plates, ship, bridge and tank	8.15.0	8.15.0	8.15.0	8.12.6	8. 8.6	8. 7.6	8. 7.6	8. 7.6	8. 3.9	8. 7.6	8. 7.6	8. 7.6
Sheets, black, 24 gage	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0
Sheets, galvanized, 24 gage, corrugated	16. 1.6	15. 6.3	15. 1.6	15. 3.9	14.16.0	14.12.6	14. 2.0	14. 0.6	14. 0.6	13.17.6	13.10.0	13. 5.0
Plain wire	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0
Bands and strips	11. 8.0	11. 0.0	11. 0.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0

German Prices in Marks Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry No. 3 pig iron, Silicon 2.50-3.00	85	86	86	86	86	86	86	82	77	74	74	74
Basic pig iron	88	88	88	88	88	88	88	88	87	84	84	84
Furnace coke	21	21	21	21	21	21	21	21	21	21	21	21
Billets	112	112	112	112	112	112	112	112	112	112	112	112
Standard rails	140	140	140	140	140	140	140	140	140	140	140	140
Merchant bars	134	134	134	134	134	134	134	134	134	134	134	134
Shapes	131	131	131	131	131	131	131	131	131	131	131	131
Plates, ship, bridge and tank	149	149	149	149	149	149	149	149	149	149	149	149
Sheets, black, 24 gage	220	220	220	220	220	220	220	220	220	220	220	220
Sheets, galvanized, 24 gage, corrugated	350	350	350	350	350	350	350	350	350	350	350	350
Plain wire	195	195	195	195	195	195	195	195	195	195	195	195
Bands and strips	154	154	154	154	154	154	154	154	154	154	154	154

French Prices in French Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry No. 3 pig iron, Silicon 2.50-3.00	540	510	510	500	500	460	460	460	460	420	420	420
Basic pig iron	580	550	545	535	535	495	495	495	495	455	455	455
Furnace coke	200	190	190	190	180	180	170	170	170	158	155	155
Billets	680	510	530	535	530	530	510	505	500	495	490	490
Standard rails	850	850	850	840	840	840	795	795	785	775	770	755
Merchant bars	770	625	610	620	610	610	565	560	555	550	550	555
Shapes	710	590	580	580	575	575	540	540	530	525	525	530
Plates, ship, bridge and tank	875	775	800	775	755	740	725	700	695	700	710	715
Sheets, black, 24 gage	1565	1285	1520	1410	1400	1400	1335	1315	1285	1290	1305	1325
Sheets, galvanized, 24 gage, corrugated	2500	2150	1955	1900	2000	2000	2000	1880	1970	2250	2250	2250
Plain wire	1450	1395	1400	1400	1400	1200	1200	925	900	900	900	900
Bands and strips	925	785	765	770	755	740	740	710	710	680	670	670

Belgian Prices in Belgian Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry No. 3 pig iron, Silicon 2.50-3.00	725	700	700	675	655	635	630	615	615	615	590	590
Basic bessemer pig iron	700	690	685	685	665	635	630	560	560	565	560	560
Furnace	270	250	230	220	220	185	185	185	185	185	185	185
Billets	785	800	750	790	785	790	800	775	780	790	790	790
Standard rails	1000	1000	1000	1000	1000	1050	1100	1100	1100	1100	1100	1100
Merchant bars	950	910	920	905	895	875	875	875	875	865	865	865
Shapes	960	911	922	910	895	870	870	855	855	850	855	855
Plates, ship, bridge and tank	1130	1120	1125	1110	1075	1100	1085	1075	1080	1080	1080	1080
Sheets, black, 24 gage	2100	2100	1715	1885	1700	1735	1750	1700	1700	1700	1700	1700
Sheets, galvanized, 24 gage, corrugated	3900	3900	3400	3290	3250	3190	3000	2960	2850	2850	2850	2825
Plain wire	1600	1625	1650	1650	1650	1650	1650	1650	1650	1620	1435	1400
Bands and strips	1205	1120	1125	1000	1000	1020	1020	1000	1025	1005	1015	1020

Competition Acute in Europe

Prices Reach Uneconomic Level—Great Britain Bears Heavy Costs—Continent Better Equipped to Compete—Tendency Toward Amalgamations and Price Control

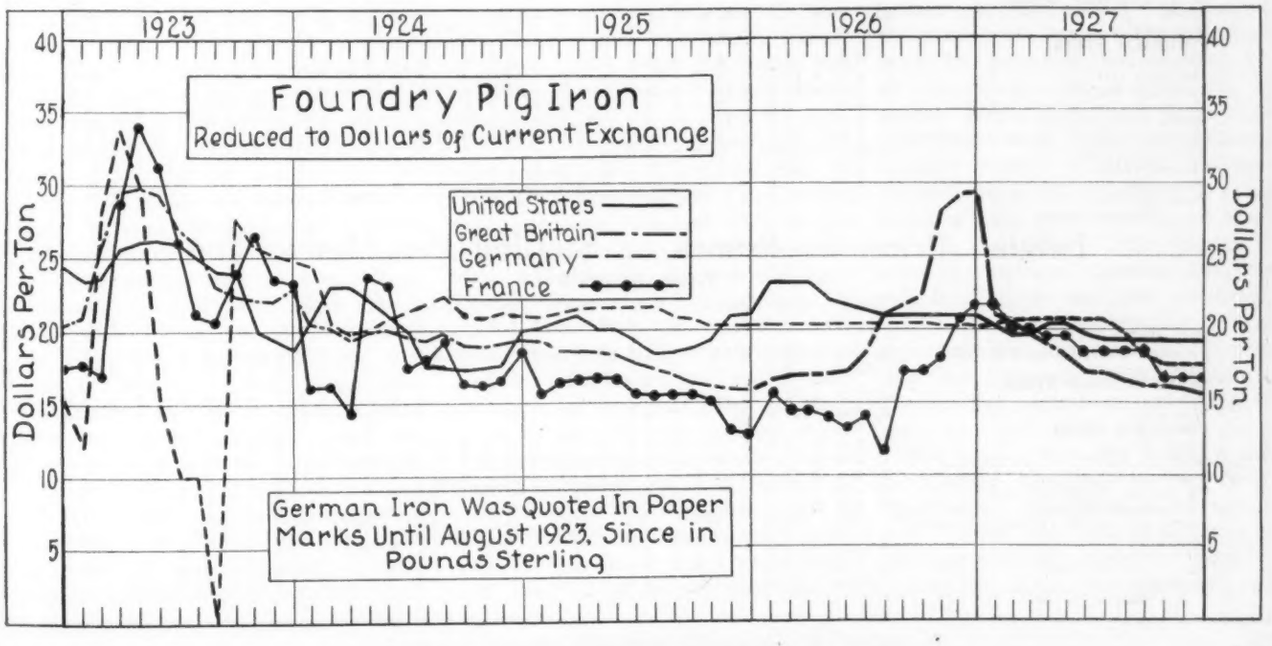
By Vincent Delport
European Manager, Iron Trade Review

SURVIVAL of the fittest will be the outcome of strenuous efforts by the iron and steel industries of Europe to maintain their hold on world markets. The year was marked by competition of the severest kind, forcing prices down to a level unanimously recognized as uneconomic. Yet the industry never was so active. It has been a year of struggle between consumer and producer as to who could obtain the best price, and the consumer has won. Whether it will prove to be a Pyrrhic victory remains to be seen.

In the price-cutting contest, those concerns with modern and self--contained plants have the advantage. The continent maintains the advance it has acquired over Great Britain since the war. The British iron and steel industries have heavier costs. In addition, Britain, for the best part of 1927, felt the effects of the crisis of 1926. Germany has enjoyed a comparatively prosperous year. The constant heavy demand of home consumers has enabled German steelmakers relatively to ignore those lines of export business which yielded unremunerative prices. France, and to a lesser extent Belgium and Luxemburg, have been compelled to make up for a dull home trade by selling abroad at any cost.

The situation as 1928 opens is unsatisfactory. Presumably, the German domestic market will reach a point of saturation and producers will direct attention to export markets, increasing the excessive competition. French and Belgian steel concerns cannot indefinitely trade on little or no profit. Britain faces problems that involve the very existence of her basic industries. The effects on prices of the continental steel entente have disappointed. Continental hopes are centered on an agreement between leading exporting nations to cover allocation of export tonnages and fix minimum export prices for certain classes of steel. Combination of allied interests also is being resorted to.

Many British steelmakers feel they will find the means of reviving their industries, free from outside commitments. A step has been made in amalgamation of heavy industries, and further developments are in sight. Important Belgian mergers are under way, and many leading French concerns already are closely connected. The coming year doubtless will see an expansion of the aims of international ententes, and closer cooperation between the steel industries of individual nations. A common interest may well obliterate national boundaries and prove the iron and steel industry to be an instrument for peace instead of war.



European Iron and Steel Export Prices in 1927

F.o.b. Ports of Shipment

British Prices in Pounds Sterling Per Gross Ton

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3, Middlesbrough	4. 5.6	4. 4.6	4. 1.6	4. 0.0	3.15.0	3.10.0	3.10.0	3. 7.6	3. 5.0	3. 5.0	3. 5.0	3. 5.0
Basic, Middlesbrough	5. 1.3	4.16.0	4.16.0	4.16.0	4.16.0	4.16.0	4.16.0	.....	.....	.....	.....	.....
Scotch Foundry	4.15.0	4.11.9	4. 7.6	4. 7.6	4. 5.3	4. 0.3	3.17.6	3.16.0	3.15.0	3.15.0	3.12.6	3.12.6
Hematite East Coast	4.11.0	4. 9.3	4. 6.3	4. 3.9	4. 1.0	3.18.6	3.16.0	3.15.0	3.14.3	3.14.0	3.12.0	3.11.6
SEMIFINISHED STEEL												
Billets	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	5.19.0	5.15.0	5.15.0	5.15.0	5.15.0	5.15.0
Wire rods	9. 0.0	9. 0.0	9.10.0	9.10.0	9.10.0	9.10.0	9. 8.0	9. 5.0	9. 5.0	9.13.0	9.15.0	9.15.0
FINISHED STEEL												
Standard rails	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0
Merchant bars	8. 0.0	8. 0.0	8. 0.0	7.16.0	7.15.0	7.10.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0
Structural shapes	6.15.0	6.15.0	6.15.0	6.15.0	6.14.0	6.12.6	6.12.6	6.12.6	6.12.6	7. 2.6	7. 2.6	7. 2.6
Plates, ship, bridge and tank	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.15.0	7.11.9	7.17.6	7.17.6	7.17.6
Sheets, black, 24 gage	11. 0.0	11. 0.0	11. 0.0	10.17.6	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0
Sheets, galvanized, 24 gage, corrugated	16. 1.6	15. 6.3	15. 1.9	15. 3.9	14.16.0	14.12.6	14. 2.0	14. 0.6	14. 0.6	13.17.6	13.10.0	13. 5.0
Bands and strips	11. 0.0	11. 0.0	11. 0.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0	10.10.0
Plain wire, base	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0	9.15.0
Galvanized wire, base	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0
Wire nails, base	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0
Tinplate, base box 108 pounds	1. 1.3	1. 0.3	1. 0.0	1. 0.0	0.19.3	0.19.0	0.18.9	0.18.6	0.18.6	0.18.0	0.17.9	0.17.9
Furnace coke	1. 5.0	1. 5.0	1. 5.9	1. 4.0	1. 2.6	1. 1.3	0.13.6	0.12.0	0.12.6	0.13.0	0.13.0	0.13.0
Ferromanganese*	20.12.6	20. 8.6	20. 8.6	20. 8.6	20. 2.0	19.12.0	18.11.3	18.11.3	18.11.3	18.11.3	18.11.3	18.11.3

*Delivered Atlantic Seaboard, duty-paid.

German Prices in Pounds Per Metric Ton

F.o.b. Rotterdam or Northern Sea Ports

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3 Silicon 2.50 3.00	4. 1.9	4. 0.0	3.16.3	3.12.6	3.12.6	3.12.6	3. 0.0	3. 0.0	3. 0.0	3. 0.0	3. 0.0	3. 0.0
Basic bessemer	3.14.3	3.11.0	3.11.0	3.11.0	3.11.0	3.11.0	3. 0.6	3. 0.0	3. 0.0	3. 0.0	3. 0.0	3. 0.0
Hemitite	4. 8.0	4. 8.0	4. 8.0	4. 8.0	4. 4.0	3.17.6	3.11.0	3.11.0	3.11.0	3.10.3	3.10.0	3.10.0
SEMIFINISHED STEEL												
Billets	5. 5.0	5. 5.0	4.17.6	4.14.0	4.12.6	4. 7.0	4. 7.0	4. 7.0	4. 7.0	4. 7.0	4. 7.0	4. 7.0
Wire rods	5.18.9	5.15.9	5.15.0	5.11.9	5. 9.0	5.12.6	5.12.6	5.12.6	5.11.9	5.10.0	5.10.0	5.10.0
FINISHED STEEL												
Standard rails	6. 0.0	6. 0.0	6. 0.0	6. 5.0	6. 5.0	6. 5.0	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6
Merchant bars	5.11.3	5.11.6	5. 3.0	5. 1.6	4.18.3	4.17.0	4.14.6	4.13.0	4.13.0	4.13.6	4.14.0	4.15.0
Structural shapes	5.10.3	5. 8.9	5. 8.0	5. 6.0	4.17.3	4.14.0	4.12.6	4.12.0	4.12.0	4.12.0	4.12.0	4.12.0
Plates, ship, bridge and tank	6.15.0	6. 7.0	6. 6.0	6.10.3	6. 2.9	6. 0.0	6. 0.0	6. 0.3	6. 0.0	6. 0.0	6. 7.6	6.15.0
Sheets, black, 24 gage	11. 0.0	11. 0.0	12.10.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0
Sheets, galvanized, 24 gage, corrugated	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0
Bands and strips	6.15.9	6.12.9	6. 7.6	6. 7.9	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0	6.15.0
Plain wire, base	7. 4.0	7. 3.0	7. 4.3	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0	7. 5.0
Galvanized wire, base	9. 5.0	9. 3.6	9. 8.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0
Wire nails, base	7.19.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0
Tinplate, base box 108 pounds	1. 8.0	1. 8.0	1. 8.0	8. 1.0	1. 8.0	1. 8.0	1. 8.0	1. 8.0	1. 8.0	1. 8.0	1. 8.0	1. 8.0
Ferromanganese	15.10.0	15. 5.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0

French Prices in Francs or Sterling Per Metric Ton

F.o.b. Channel Ports or Antwerp

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3, Silicon 2.50-3.00	4. 0.0	3.18.0	3.15.3	3.11.3	3. 6.0	3. 2.6	3. 0.9	3. 2.0	3. 1.0	2.18.0	3. 0.0	3. 1.0
Basic bessemer	3.12.9	3. 8.6	3. 6.6	3. 5.9	3. 3.3	3. 1.6	3. 1.0	3. 0.0	2.19.0	2.17.0	2.17.6	2.19.0
Hematite*	680	620	620	620	615	610	580	555	555	555	555	555
SEMIFINISHED STEEL												
Billets	4.17.9	4. 8.3	4.12.6	4.11.3	4. 8.9	4. 8.9	4. 7.6	4. 7.0	4. 6.3	4. 4.3	4. 5.0	4. 6.0
Wire rods	6. 0.0	5.13.0	5. 6.6	5. 4.9	5. 5.3	5.10.0	5.12.6	5.12.6	5.11.3	5. 9.6	5.10.0	5.10.0
FINISHED STEEL												
Standard rails	6. 0.0	6. 0.0	6. 0.0	6. 5.0	6. 5.0	6. 5.0	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6
Merchant bars	5. 4.9	4.17.3	5. 0.0	4.16.6	4.14.0	4.14.9	4.13.3	4.14.0	4.13.6	4.13.0	4.15.6	4.16.0
Structural shapes	5. 4.6	4.17.3	4.18.3	4.15.6	4.13.6	4.13.9	4.12.0	4.11.0	4.10.3	4. 7.9	4. 8.0	4. 8.0
Plates, ship, bridge and tank	6. 4.0	6. 0.0	6. 2.6	6. 0.9	5.18.3	6. 1.0	6. 0.0	6. 0.6	6. 0.6	6. 0.0	6. 0.0	6. 0.0
Sheets, black, 24 gage	11. 0.0	10. 1.3	9.17.6	10. 0.9	9.12.0	9.18.0	9.16.0	9.15.6	9.16.0	9. 6.3	9.14.0	9.14.0
Sheets, galvanized, 24 gage, corrugated	16. 1.6	15. 9.3	15. 4.3	15. 3.9	14.16.0	14.12.6	14. 2.0	14. 0.6	15. 1.3	18. 0.0	16. 0.0	15. 0.0
Bands and strips	6.13.0	6. 7.6	6. 9.0	6. 3.0	6. 0.3	6. 0.3	5.16.0	5.12.6	5.11.3	5. 5.0	5. 8.3	5.10.0
Plain wire, base	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	6.19.3	6.15.0
Galvanized wire, base	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 2.6	8.15.0
Wire nails, base	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7. 8.9	7. 7.6

*French francs.

Belgian Prices in Francs or Sterling Per Metric Ton

F.o.b. Antwerp

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3, Silicon 2.50-3.00	4. 0.0	3.18.0	3.15.3	3.11.3	3. 6.0	3. 2.6	3. 0.9	3. 2.0	3. 1.0	2.18.0	3. 0.0	3. 1.0
Basic bessemer	3.12.9	3. 8.6	3. 6.6	3. 5.9	3. 3.3	3. 1.6	3. 1.0	3. 0.0	2.19.0	2.17.0	2.17.6	2.19.0
SEMIFINISHED STEEL												
Billets	4.17.6	4. 8.3	4.12.6	4.11.3	4. 8.9	4. 8.9	4. 7.6	4. 7.0	4. 6.3	4. 4.9	4. 5.0	4. 6.0
Wire rods	6. 0.0	5.13.0	5. 9.0	5. 4.9	5. 5.3	5.10.0	5.12.6	5.12.6	5.11.3	5. 9.6	5.10.0	5.10.0
FINISHED STEEL												
Standard rails	6. 0.0	6. 0.0	6. 0.0	6. 5.0	6. 5.0	6. 5.0	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6	6. 7.6
Merchant bars	5. 4.9	4.17.3	5. 0.0	4.16.6	4.14.0	4.14.9	4.13.3	4.14.0	4.13.9	4.13.3	4.15.6	4.16.0
Structural shapes	5. 4.6	4.17.3	4.18.9	4.15.3	4.13.6	4.13.9	4.12.0	4.11.0	4.10.0	4. 8.0	4. 8.0	4. 8.0
Plates, ship, bridge and tank	6. 4.0	6. 0.0	6. 2.6	6. 0.9	5.18.3	6. 1.0	6. 0.0	6. 0.6	6. 0.6	5.19.3	5.18.9	5.19.0
Sheets, black, 24 gage	11. 0.0	10. 1.3	9.17.6	10. 0.9	9.12.0	9.18.0	9.16.0	9.15.6	9.16.0	9. 6.3	9.14.0	9.14.0
Sheets, galvanized, 24 gage, corrugated*	3900	3900	3400	3285	3250	3185	3000	2960	2850	2850	2825	2825
Bands and strips	6.13.0	6. 7.6	6. 9.0	6. 3.0	6. 0.3	6. 0.3	5.16.0	5.12.6	5.11.3	5. 5.0	5. 8.3	5.10.0
Plain wire, base	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	7. 2.6	6.19.3	6.15.0
Galvanized wire, base	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 5.0	9. 2.6	8.15.0
Wire nails, base	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.17.6	7.12.6	7. 7.6

*Belgian francs.

British Working Against Odds

Depression Follows Post-Strike Revival—Foreign Steel Invasion Continues—Tin Plate Industry Low but Shipbuilding Shows Marked Improvement—Hopes Entertained for Future

By Joseph Horton
British Correspondent, Iron Trade Review

HAPPILY no such catastrophe has to be recorded in Great Britain as the coal strike of 1926, which cast its blight on the iron and steel trade and brought the country practically to a standstill. But its malign influence made the past year's record exceptional. The year was mainly one of readjustment, and the earlier months undoubtedly exhibited a certain amount of inflation as the result of the accumulated orders in the previous year. It is significant that steel production was on an ascending scale in January, reaching its climax in March with 949,600 tons. This was over 300,000 tons in excess of the pre-war monthly average of 638,600 tons. At that time it became apparent that arrears were getting worked off. The hope expressed in March that the million ton mark might eventually be reached was not realized. Reaction brought with it some reductions in wages, the average weekly earnings in February of £3 5s 1d ($15.80) having fallen to £2 18s 6d ($14.15) in September.

Shipbuilding Is Encouraging

Iron and steel unemployment increased from 15.4 per cent in March to 20.3 per cent in October. Engineering showed some improvement from 10.3 per cent in March to 8.3 per cent in October. Shipbuilding in the same period showed a reduction in unemployment from 29.0 per cent to 21.0 per cent; but shipbuilding output improved in that period, and indeed the shipbuilding improvement is one of the features of the year. In spite of disappointments, some hopeful facts emerge. There is every reason to believe that trade is more stable than it was. It is generally a good sign when orders are wanted for urgent delivery, though the quantities may not be large, and that has been the case for some time. The ability to deliver quickly keeps down the weight of orders, and this has led to a sort of hand-to-mouth buying.

The event of the year with regard to prices was the decision of manufacturers to give a rebate to customers undertaking to purchase only British goods. Unfortunately, from their point of view, they cannot prevail upon the government to apply to the industry the Safeguarding of Industries Act, though there are occasional rumors that the authorities have this at the back of their minds, and that sooner or later tariffs will come. The chief opponents are the shipbuilding, tin plate and sheet industries, which it has frequently been stated have been saved by the ability to buy in the cheapest market, and for some years continental steelmakers have undersold their British competitors. A hopeful feature of the Board of Trade's return is a marked falling off in imports in the later months, which may possibly be an effect of the rebate scheme.

Forge and foundry pig iron exports showed some fluctuation, and a feature of the pig iron business was the success at one period of the efforts of the foreigner to export forge and foundry iron into Great Britain. Basic pig iron has for some years been a very large item of import, but for forge and foundry the British have been in the main exporters, sending over large quantities of this class of material which undoubtedly, led to the concession by smelters to foreign buyers of pig iron of 2s 6d (60c) reduction in price as against the English buyer. Imports of forge and foundry iron still are a feature in spite of the price concession, but the tide seems to have turned in the other direction.

Under the head of exports, the most remarkable falling off was in tin plate. This industry had a bad year, and more has been done in this period to organize for self-protection than, probably, in any previous year. The pooling system for regulation of output has been in operation for some time, but it has not prevented a severe fall in values, and it does not seem to have had much influence in increasing the sum total of trade.

The success of the rebate system already referred to is a matter of some obscurity. Its payment will be based upon the customer's declaration when he comes to pay his account. The weak place is the exclusion of the reroller from the scheme, and his entire absence from commitments leaves a big loophole for the use of foreign semifinished steel; the reroller uses this foreign semifinished material and has no difficulty in underselling the large steelmaker. This foreign material can easily be introduced into small sections in structural work; only the larger parts usually bear the name of the British maker. There is plenty of evidence that foreign steel is being used in structural undertakings, owing to the great difference in price, and the fact that the usual tests leave a large margin of safety. Probably no case of breakdown has occurred due to the use of foreign material. The railways also have for some time insisted on the exclusion of foreign steel from the rerolled material.

Plate Mills Need Tonnage

In the shipbuilding industry the ability to use foreign plates has doubtless involved some saving, but, in the main, ships have been built of English steel. It is well known that the largest expansion of plant in recent years has been in the laying down of really up-to-date plate mills, and some of these have no superior in the world, but, unfortunately, they cannot get full work. The state of the steel trade gives little encouragement for extension, but a great deal of machinery was scrapped and replaced during the year, despite the fact that many steelworks failed to make a profit. In several instances reconstruction was necessary to enable firms to hold their own in the struggle for existence. The burden of local and national taxation has pressed heavily on iron and steelworks, and it is especially irritating to those great concerns in the steel trade which still are paying heavy debenture charges for capital raised during the war.

The burden of heavy railway rates is another handicap to the British steelmaker. For example, he pays 2s (48c) more for the importation of his ore than the foreigner pays for a similar distance. Railway rates

are 60 per cent above pre-war, and the rates for dock dues are much larger because of the great rise in the cost of dock labor. Among the benefits which the year brought is the great reduction in the cost of fuel, while the extension and cheapening of electricity brought substantial relief in the cost of driving energy.

Builders of rolling stock began the year with heavy arrears which had accumulated largely because of the want of fuel. These orders have very largely been worked off. The position has greatly changed and the companies now are seeking earnestly for work. They have had a very good run of business, especially with the South American companies. The British railways have been very fair buyers of rolling stock, although, of course, they make the bulk of their own, and a feature of the year was the large purchases of exceptionally powerful locomotives. Many thousands of cars were built, but the lines still are much under their work and complaints of congestion are frequent enough to indicate the state of affairs if business were to recover on a large scale. The railways will be big customers when they decide to buy.

The wrought iron industry has a stern struggle to maintain its existence, and works devoted to the manufacture of this material steadily reduce in number. Probably the popularity of this old-fashioned metal among engineers and others has increased partly as the result of vigorous propaganda by ironmasters and others. The merits of wrought iron as a rust-resister are well recognized, but the great disparity in price still gives a decided advantage to steel, which, undoubtedly, prevents a larger use of wrought iron. The research-ers of the district have been busy for a long time in seeking to discover a method of producing the metal in mass, and many thousands have been spent by leading firms in the search. It has not, however, been successful, and the mechanical puddling furnace has not been transplanted from America to this country. The problem has not been solved chemically, on the lines of the discoveries which revolutionized the steel trade with the bessemer and siemens-martin processes, although many chemists believe that this is a chemical rather than a mechanical problem.

In regard to the future, comments by chairmen of companies have lately been more optimistic and in several instances they were able to speak of better order books and generally improving prospects. It is believed that such progress as has been made is of a solid character and likely to be permanent. Steel-using industries in several instances are increasing their consumption and certain nonferrous industries, for example, the manufacturers of copper tubes, are getting unmistakably busier through the shipbuilding revival. Apparently there are no large stocks in consumers' hands. Any improvement in general requirements will therefore bring immediate business to the steelmaker, although the enormous increase in capacity means that such requirements are quickly overtaken. It is evident that competition will be much keener in future owing to the large increase in plant efficiency, and the constant entry of new competitors into the field with the inevitable speeding up of output. It is likely that more will be heard in the coming year of pressure for the Safeguarding of Industries Act. After all, even a key industry must make profits, and nobody knows better than Premier Baldwin the financial plight of the steel trade. Rumors have been rife lately that the premier has altered his mind and may concede help to the trade in spite of the resistance of the steel-using industries.

British Exports in Gross Tons During 1927

	January	February	March	April	May	June	July	August	September	October
Scrap	12,884	6,914	8,327	19,697	22,113	21,256	44,302	27,582	23,647	21,399
Pig iron:										
Forge and foundry	1,893	4,865	11,863	7,556	13,709	8,598	15,451	12,222	13,015	18,427
Acid	536	6,696	9,668	7,656	18,570	13,757	10,209	11,948	11,235	7,718
Basic	.....	.....	510	.....	.....	.....	150	.....	39	.....
Ferroalloys	2,036	2,230	4,364	1,980	4,644	8,274	8,021	4,393	6,650	4,718
Steel ingots	216	111	32	113	452	442	401	117	270	823
Blooms, billets, slabs, etc.	145	154	260	464	681	476	488	115	919	646
Bars, rods, angles, shapes	20,533	26,177	37,556	33,518	39,374	31,912	28,795	25,225	28,272	30,331
Castings, iron	185	117	79	44	72	88	66	137	121	86
Castings, steel	81	18	130	38	86	67	102	70	137	127
Forgings, iron	10	15	30	16	14	4	9	21	7	19
Steel girders, beams, etc.	4,874	6,792	10,246	7,184	12,510	11,907	13,130	11,143	10,065	8,162
Hoops and strips	3,595	3,823	4,922	3,952	5,367	4,384	3,547	2,804	4,122	4,154
Plates and sheets, not galvanized:										
Armor plates	....	....	....	....	....	....	....	....	....	43
Plates and sheets not under ⅛" thick	2,915	10,765	15,911	18,176	20,699	18,730	20,425	15,666	15,408	14,609
Plates and black sheets under ⅛" thick	13,351	15,983	23,420	20,520	27,836	28,010	24,853	18,630	23,867	20,864
Black plates	2,468	4,580	5,172	5,943	2,693	3,488	1,670	1,553	2,306	2,252
Plates and sheets, coated:										
Galvanized sheets	65,205	48,925	66,991	64,384	74,165	59,752	69,406	65,130	74,937	66,687
Tin plates	26,863	40,441	48,336	42,616	50,937	44,670	38,611	32,450	36,941	36,027
Cast tubes, pipes and fittings	5,063	4,648	8,095	10,787	11,955	10,033	13,292	12,496	9,938	12,021
Wrought tubes, pipes and fittings	22,376	18,012	23,744	21,910	21,413	16,609	21,336	17,030	20,722	25,518
Rails for trams	716	1,004	3,805	2,101	2,170	1,325	1,032	925	2,333	662
Railway rails	1,811	14,223	24,753	29,594	36,840	37,273	43,877	44,283	55,119	48,212
Sleepers and fishplates	865	3,801	8,718	11,450	18,750	10,058	21,111	15,838	7,603	20,776
Tires and axles	1,059	1,051	1,744	1,744	2,953	2,822	2,815	2,327	3,556	4,506
Wheels and axles	1,103	1,028	1,761	1,507	3,575	4,005	3,795	3,043	5,376	3,879
Railway material, other types	4,590	4,214	5,886	5,495	9,297	7,527	8,857	4,332	5,070	5,407
Wire	6,536	4,925	5,963	4,061	7,020	5,831	5,503	5,598	7,147	5,353
Wire manufactures	4,272	3,777	3,762	3,170	3,457	2,998	2,773	3,457	3,497	3,646
Nails and tacks	1,420	1,041	1,449	1,384	1,696	1,443	1,230	1,525	1,736	1,804
Wood screws	332	319	462	194	297	240	228	243	278	213
Bolts and nuts	2,296	1,942	2,855	2,049	2,858	2,172	1,954	2,022	2,607	2,397
Manufacturers of cast iron	1,821	1,328	1,408	1,295	1,768	1,197	1,028	1,018	1,617	1,535
Anchors, cables and chains	1,411	1,205	2,405	1,277	1,479	1,407	1,065	1,135	1,325	1,098
Bedsteads and finished parts	1,059	864	859	692	932	978	820	1,077	1,010	1,063
Hollow ware	1,405	1,039	1,331	1,094	1,382	1,243	1,013	1,093	1,336	1,377
Other manufactures of iron and steel	14,783	14,538	13,500	19,399	19,068	22,886	21,157	21,933	24,974	27,852
Total, including scrap	232,253	258,629	361,364	354,231	444,539	387,306	433,949	369,987	408,566	406,183

Active Year For German Steel

Heavy Domestic Business Makes Up for Export Losses—Real Progress Made in Plant Efficiency—Exports Drop While Imports Increase — Coal Industry Less Flourishing

By Dr. E. H. Regensburger

German Correspondent, Iron Trade Review

ECONOMIC conditions in Germany in 1927 were distinctly prosperous in comparison with conditions in other European nations. The iron and steel trades had their share of activities. Although exports were about 10 per cent less in tonnage than in 1926, the recovery of domestic purchasing power, stimulated by the large foreign loans granted Germany, enabled steel makers to enjoy a large volume of business at prices considerably above those in export trade. At the end of the year about 80 per cent of the output was sold at home, exceeding in volume sales effected before the war within present boundaries.

The financial results were not proportionate to the volume. Increases of wages and taxation resulted in heavier costs of production, while the government took measures to prevent selling prices from exceeding certain limits. Domestic prices, however, were higher than those in foreign markets. Merchant bars were sold at 134 marks ($32) per ton to domestic consumers, against £4 15s ($23) for export. In fact, export sales were made at a loss and part of the profit on domestic trade went toward covering these losses, and supplying the fund from which export rebates were paid to users of semifinished products who transformed them for export purposes. Production of pig iron, steel and rolled products in 1927 by far exceeded all previous figures, even in comparison with 1913 in considering Germany in her present boundaries. This fact is illustrated by the accompanying table.

The end of the year was overshadowed by decision of the government to give full effect to the 8-hour working day regulations. Iron and steelmakers claim enforcement of the shorter working day will compel them to employ 18,000 extra workers, of which about only 6000 skilled men are available. This will further necessitate providing additional housing accommodations at a cost estimated to reach several million marks. It is feared that strict enforcement of the 8-hour day will neutralize good results obtained from the rationalization of industry.

Progress was made last year in the rational organization of the more important concerns. The most striking example is Vereinigte Stahlwerke, A. G., the Rheinisch combine formed in 1926. This corporation, also associated with plants in central Germany and Upper Silesia, controls roughly 50 per cent of the coal and iron output of Germany. In the report covering the financial year ending Sept. 30, 1927, a comparison between production of that period and the preceding one shows output of coal increased by 10 per cent, coke by 33, pig iron by 40, and of raw steel by 34. The number of workers employed from Sept. 30, 1926, to Sept. 30, 1927, increased only from 83,771 to 88,732, or by 5.9 per cent, in the mines, and from 86,667 to 94,342, or by 8.8 per cent, in the iron and steelworks. Costs of production were materially reduced. Unfilled orders at the end of the financial year were 33 per cent over a year ago and were sufficient to keep the works going two months. Profits, however, did not rise proportionately from one year to another, wages having increased from 20 to 30 per cent since April, 1926, while the burden of taxation and social welfare also increased. The Vereinigte Stahlwerke yet were able to maintain their dividend of 6 per cent. The few remaining independent concerns also put their house in order, and the dividend of the Kloeckner works increased from 5 to 7 per cent, and that of the Hoesch steelworks from 5 to 8 per cent.

German steelmakers feel their quota in the European steel entente is insufficient. Owing to intensity of domestic demand, Germany's output of raw steel last year exceeded the quota by roughly 3,500,000 tons, on which, according to the original scheme, the penalty would have been $4 per ton. Other members of the entente accepted to reduce the penalty on that portion of Germany's excess output sold at home. It was agreed that 72 per cent of the German output should be considered as for domestic production, the tonnage available for export being restricted to 28 per cent. The full penalty of $4 per ton in excess continued to be applied to the export tonnage and the penalty on the domestic excess was reduced to $2 for second and third quarter and $1 for last quarter. Notwithstanding these concessions, Germany had to pay a large sum into the common fund, and it is estimated that her contribution for third quarter amounted to about $3,000,000, corresponding to 72c per ton of steel produced, as against $1,854,000, or 46c per ton, in second quarter. Should German domestic business decrease, a larger tonnage would be pushed on export markets under the handicap of the $4 penalty, which would favor Germany's competitors.

Generally speaking, the entente did not yield anticipated results. World prices remained low and, from the point of view of Germany, quotas did not prove satisfactory. German steelmakers are the more disappointed as they were among the most enthusiastic supporters. President Reusch, of the Gutehoffnungshutte, addressing the annual meeting of stockholders late last year, declared the entente

German Iron and Steel Production

Metric Tons—000 Omitted

	No. fur. in blast*	Pig iron	Steel ingots castings	Rolled products
Mo. ave. 1913†	204	910	994	970
Mo. ave. 1924	106	651	820	681
Mo. ave. 1925	83	931	1,016	854
Mo. ave. 1926	109	804	1,028	856
1927				
Jan.	116	1,060	1,308	1,043
Feb.	113	967	1,233	952
Mar.	111	1,086	1,415	1,101
Apr.	113	1,052	1,288	1,009
May	112	1,130	1,378	1,090
June	113	1,068	1,328	1,063
July	115	1,109	1,362	1,050
Aug.	115	1,116	1,426	1,130
Sept.	114	1,105	1,371	1,122
Oct.	113	1,140	1,414	1,113
Mo. ave.	.....	1,077	1,354	1,069

*On last day of year or month.
†Figures for 1913 are for Germany in her present boundaries.

in its present form could only survive if negotiations being conducted in view of formation of international sales agreements were brought to a satisfactory conclusion. The coming year will probably see formation of selling syndicates for semifinished and structural steel, but should negotiations fail, the present entente will be weakened.

Germany's export trade contrasted with 1926, when sales to foreign markets were on a larger scale. Last year's considerable demand from domestic consumers enabled steelmakers to operate their plant at full capacity without accumulating stocks. At the end of 1927 the German works had sufficient orders on their books to keep them going for about three months. President Kloeckner, of the Kloeckner works, stated that in his view there is no reason to anticipate any considerable deterioration in market conditions. On the other hand, it is not expected production can continue at the recent high rate and be absorbed indefinitely in the home market. A slight recession was beginning to be noticeable toward the end of 1927.

The principal consuming industries in Germany in 1927 were the building trades, the public utilities, the electrical industries, the machine manufacturers and the railroads, the last named having passed considerable orders for rolling stock. Unemployment figures for the country declined from 1,750,000 at the beginning of the year to 340,000 at the end of October.

Germany Loses Export Markets

While in 1926 about 50 per cent of the German output of merchant bars and structural shapes was sold abroad, for the greater part of 1927 the percentage dropped to about 28 per cent, which figure may be applied generally to other products. At the end of the year percentage of exports to production was reduced to about 20 per cent, which reflects satisfactory home consumption. In view of the low level of world prices and activity of home trade, German steelmakers found it to their advantage to accept the limitation of exports suggested by the entente nations to lighten the burden of penalties for excess production. Germany's capacity to export also was reduced by increased duties levied by certain countries, and by preferential treatment adopted by others. Keen competition was experienced from France, Belgium, Luxemburg, and in some cases Great Britain. The Chinese upheaval and financial difficulties in Japan also exerted their influence.

In the first nine months German iron and steel exports declined from 3,888,628 metric tons in 1926 to 3,489,001 tons in 1927. The actual decrease is greater than indicated by these figures, because dating from 1927 the returns include reparations deliveries, not included in the returns of previous years. Total exports, scrap included, may be estimated for 1927 at 4,500,000 metric tons, with reparations deliveries, as compared with 5,348,000 tons in 1926, without reparations deliveries. In January last year exports of iron and steel were 515,000 tons; this was the highest mark of the year, the average monthly exports being about 350,000 tons for the other months, excepting March when 419,000 tons were shipped. Only a limited number of commodities registered a slight increase over the preceding year, the exception being for iron castings, plates, sheets and tin plate, railroad axles, wheels and tires, barbed wire and tools.

German Iron and Steel Exports

(Metric tons)

Commodity	(January to September) 1927	1926	1925
Pig iron and ferroalloys	298,855	336,729	150,035
Scrap	190,545	326,056	193,800
Cast iron pipe	61,296	56,724	53,900
Other castings	86,682	75,232	69,373
Semifinished steel	265,627	302,679	59,273
Brass, shapes and bands	692,882	860,122	376,957
Plates and sheets, plain	382,175	373,423	298,991
Tin plates and galvanized sheets	52,204	40,315	26,128
Wire rod and wire	302,488	345,099	220,418
Steel pipe	216,533	224,878	168,608
Rails and track fastenings	283,627	376,411	346,019
Railroad axles, wheels and tires	47,138	40,390	60,307
Bridge and structural steel	48,358	30,541	20,510
Agricultural implements	32,217	41,644	36,715
Tools and implements	28,548	25,355	25,897
Nails, screws, bolts, etc.	152,142	149,225	140,260
Hardware	23,347	22,104	22,470
Total, including items not specified above	3,489,001*	3,888,628	2,502,542

*Including reparations deliveries.

Imports of iron and steel into Germany in 1927 were more than double 1926. They are estimated for all 1927 at 2,750,000 metric tons, against 1,261,000 tons in 1926, scrap included. The increase is mainly due to pig iron, semifinished steel, merchant bars and structural steel. Germany's export surplus of iron and steel has thus dropped from 4,086,000 metric tons in 1926 to about 1,750,000 tons in 1927, a decrease of 57 per cent.

May Lose Neglected Markets

While the domestic market is capable of absorbing surplus tonnage the situation, from the producers' point of view, is satisfactory, but should the purchasing power of the country diminish, the steelmakers may find it difficult to regain the markets they have neglected.

German pig iron producers have met with foreign competition in their own market, especially from Great Britain. Domestic quotations were several times reduced. In the first nine months 186,794 metric tons of pig iron was imported, compared with 78,233 tons in the corresponding period of 1926. Exports, on the other hand, dropped from 299,563 tons to 267,320 tons, the decrease being particularly due to smaller shipments to the United States. Taking into account production and imports and exports of pig iron, it is estimated that Germany's consumption in the first three quarters of 1927 was about 4,400,000 tons in excess of the corresponding period of 1926.

Shipments of pig iron to the United States in the first nine months of last year were less than 10,000 tons, compared with 137,941 tons in the corresponding period of 1926. There were no important stocks in Germany at the end of the year. On Oct. 31 the active list of furnaces numbered 113, compared with only 97 on Oct. 31, 1926.

Ore Imports Make Gain

In the first nine months imports of iron ore were 13,358,441 metric tons in 1927, as against 6,375,759 tons in 1926. Germany's requirements of French minette ore for 1928 are already mostly covered. From an exporter of scrap Germany has turned into an importer. Increased output of coal was absorbed at home, exports being scarcely higher than in 1926 owing to British competition. Owing to greater efficiency of the iron and steel plants demand for coal has not progressed in proportion with the greater production activities of these industries.

French Industry Resists Crisis

Home Industries Depressed by Credit Restriction and Reduced Purchasing Power —Production Maintained and Exports Rise but Prices Unprofitable—Coming Elections Darken Outlook

By J. Leon
French Correspondent, Iron Trade Review

CONTRASTING with the confusion which marked the previous year owing to the violent fluctuations of the franc, 1927 was for France a year of consolidation, the currency having been maintained throughout at a relatively stable rate. The country realized that a balanced budget was essential to enable commercial transactions to be effected on a firm basis. This result was attained by enforcement of a rigorous financial policy which brought about a complete change of economic conditions, to which industry had to adapt itself. Following the artificial stimulus given to French business in 1926 by the depreciation of the franc, it was to be expected that when steps were taken to reorganize the finances of the country, industry and trade would suffer.

As far back as November, 1926, the metal-consuming industries began to feel the change. Concurrently with appearances of credit restriction, consumers believed appreciation of the franc would be accompanied by a decrease of retail prices. These hopes were disappointed, and, in fact, prices continued to rise generally until they about reached parity with the world level. At the beginning of 1927 a general abstention from buying was prevailing throughout the country. With a view to keeping down production costs and preventing unemployment, iron and steel producers endeavored to keep their plants operating to normal capacity, but in many cases they were forced to sell their products without profit, sometimes at a loss.

Producers Seek Export Trade

Manufacturers made serious efforts to find an outlet in export markets. They were assisted at the beginning of the year by the opportune decision of the government to abolish the export tax. This tax, enforced by the bills of Aug. 3 and 12, 1925, was rated at 1.30 per cent for iron and steel products. Early in the year effects of the coal stoppage in Great Britain stimulated French iron and steel exports, especially with regard to semifinished steel, but gradual resumption of British steelmaking was accompanied by a falling-off of demand for continental material, and dating from April French makers of steel experienced a difficult period. They again directed attention to the domestic market, but found that most consuming industries were overstocked with steel and were themselves hard pressed for orders.

Activities of the automobile manufacturers were considerably reduced and several concerns went bankrupt. Makers of agricultural machinery also experienced a serious crisis, for the farmers had made heavy purchases in 1926 and had only small requirements for the ensuing year. Furthermore, the crops were not up to standard and increased taxation further curtailed purchasing power. The building trades also were depressed, owing to existing legislation on rent restriction, and to the national taxation on land transactions.

Competition thus was keen among steelmakers. Prices dropped to a low level, not only in the home market but for export business as well. As an illustration the domestic price of merchant bars fell from about 725 francs per metric ton at the beginning of the year to 540 francs in November. A complete picture of the downfall of prices is given in the accompanying price tables. It will be seen that production was practically maintained and the volume of exports was considerably in excess of previous years, but these results were attained at great sacrifices in prices. At the same time, there was no alleviation of production costs. While wages remained about the same as in 1926, there was a considerable increase of transportation rates and taxation. Losses incurred by the iron and steel industries the past year must in most cases have been considerable.

1926 Profits Assist Industry

Fortunately, the substantial profits made in 1926 enabled most concerns to meet the difficulties of 1927. Business transacted in 1926, when the franc was worth about 2.70 cents, was paid for later when the currency had appreciated. The resulting profits, included in the balance sheets published in 1927, were calculated at an average of 3.90 cents. As a result, profits for the past financial year of active business were considerable.

Generally speaking, prices, expressed in paper francs, of principal

French Business Progress in 1927

	Production (Metric tons 000 omitted)					Imports (Metric tons 000 omitted)		Exports (Metric tons 000 omitted)		
Monthly Ave.	Iron ore	Coke	Pig iron and ferro-alloys	Steel ingots and castings	No. furnaces in blast*	Coke	Pig iron and ferro-alloys	Steel†	Pig iron and ferro-alloys	Steel†
1913	1,826	336	434	391	131	256	4.2	10	9	43
1924	2,416	221	641	575	133	449	4.7	57	65	187
1925	2,943	255	708	621	148	417	4.3	12	59	272
1926	3,269	314	786	702	156	463	4.1	12	59	256
1927										
Jan.	3,800	349	805	673	147	529	2.4	6.4	82	343
Feb.	3,653	313	716	628	146	432	3.6	8.1	70	382
March	3,030	344	801	704	145	394	3.3	9.2	66	378
April	3,604	331	774	681	146	389	5.4	8.0	71	410
May	3,700	337	794	712	146	426	9.9	7.8	86	346
June	3,620	336	747	672	143	397	9.2	6.9	76	330
July	3,658	344	769	677	143	195	7.3	6.1	69	352
Aug.	3,902	343	773	694	142	458	5.3	5.0	75	367
Sept.	3,871	332	761	693	141	369	3.6	3.9	62	365
Oct.	.....	.....	796	723	143	.....	.....	.....	.....	.....
Mo. Av.	3,648	336	774	686	.....	398	5.5	6.8	73	364

*On last day of year, or month. †Includes ingots, semifinished steel, rolled products, forgings and scrap.

steel products, such as rails, beams, merchant bars, plates and sheets, ranged from 400 to 440 per cent of the lowest prewar prices, and from 320 to 380 per cent of the prices then prevailing in periods of prosperity. Thus the average price of steel in France at present is about 400 per cent of prewar. There are few industries in France which operate on such a low coefficient. Selling prices of steel should be nearly 50 per cent higher to be on a parity with increased value of raw materials, wages, transportation rates and taxation.

There are presumable reasons, however, why world prices should rise. The depression of the past months was the result of the exceptional conditions under which the Belgian and Luxemburg works were operating, conditions which enabled them to take orders at low prices without incurring losses. But the index of prices in Belgium is rising and Belgian makers will not be able to afford much longer to sell their products at the present level. On the other hand, there is an increasing tendency among French producers to organize their sales. The recent difficulties have acted as an incentive toward organization of national selling syndicates and acceptance of a common discipline. Wire rod makers were the first to unite, assisted by the fact they sell their product to one class of consumers only. Already an agreement had been reached in 1926 and it was adhered to without enforcement of penalties. Formation of the official French comptoir was retarded, owing to protracted negotiations concerning the international wire rod syndicate, but it was eventually organized and has been in operation since Nov. 8, 1927.

This is the first step toward more extensive organization of selling agencies. It is expected that before long comptoirs will be formed which will handle sales of semifinished products and structural steel. Opinion also is in favor of organization of a comptoir for regulating wire products.

The results of the continental steel entente, formed on Oct. 1, 1926, still are uncertain. Its effects on the French works have been favorable inasmuch as the output of these works constantly remained below the quota allotted to them, with the result the French steel industry has received a considerable sum from the entente fund. The fact that, notwithstanding the depression of the trade, the limit fixed to the production of the member countries was not restricted during the past months, indicates that other countries could produce in excess of their quota. This, to some extent, has prevented the original aim from being fulfilled. However, the existence of the entente facilitates carrying on negotiations for organization of international selling syndicates. In addition to the measures of co-operation and rationalization resorted to, the French steelmakers have endeavored to compress their costs of production and, by concerted action, have succeeded in bringing down the price of fuel.

Early in 1927 competition of foreign countries, especially Great Britain and Belgium, forced colliery owners to reduce prices. On Jan. 1, 1927, a new Franco-German agreement was enforced by which reparations deliveries could give place to free transactions. German coke remained fixed at 21 marks per ton, but French works had the option of offering lower prices. A quota of 200,000 tons was agreed upon for March, April, and May, but no agreement could be reached on prices.

Coke Prices Forced Down

A reduction of miners' wages enabled the price of French coal to be reduced by 10 francs per ton, from April, for medium-sized orders. However, the iron and steel industries having previously passed with the collieries contracts based upon specific scales, they did not benefit by the reduction. Negotiations were started, but with no avail. Finally, iron and steel manufacturers asked the government to assist in pressing their claims, both with the French collieries and the German Kohlen Syndikat.

The government suppressed import restrictions on coke and coking coal. Then a further drop of 10 francs per ton occurred in July. In September the Kohlen Syndikat agreed to reduce the price of coke to 17 marks. Subsequently the French collieries further reduced their prices from Oct. 1 by 15 francs per ton for blast furnace coke and 10 francs for foundry coke. The situation of the collieries at the end of the year remained critical.

The new tariff act presented to the chamber of deputies was rejected. However, the government obtained authority to negotiate commercial agreements with other countries, subject to subsequent ratification by parliament. Thus the Franco-German agreement was signed on Aug. 17. Duties on pig iron, ingots, semifinished steel and most descriptions of finished steel remain subjected to the general tariff, but dating from Dec. 15, 1928, German products will enter French territory at the minimum tariff prevailing at the time.

The trend of events for 1928 is uncertain. At the end of last year there was a certain revival in various branches of the iron and steel industries. The increased demand may have been due to the belief that selling syndicates will be formed in the near future; it was partly due to the necessity for warehouses and merchants to replenish their stocks. However, it must be borne in mind that parliamentary elections are due in the spring of 1928. Until the policy of the new chamber is known, business will maintain an attitude of reserve.

French Iron and Steel Exports

(Metric tons)

Principal commodities	(First nine months) 1927	1926	1925
Scrap	292,704	131,510	451,003
Pig iron	652,594	500,509	504,400
Ferroalloys	5,119	3,336	3,315
Ingots	42,270	24,437	9,392
Semifinished steel, bars and shapes	2,126,340	1,517,706	1,509,669
Special and tool steel	1,217	1,146	1,161
Wire rods	135,348	79,930	73,930
Bands, hoops and cold rolled steel	69,294	29,174	24,478
Plates and sheets	218,723	160,305	114,106
Flats	7,905	6,261	7,216
Tin, terne and coppered plates	23,264	14,393	10,083
Wire products	40,484	30,405	42,302
Rails	300,758	267,471	175,689
Railroad tires and wheels	8,781	9,661	4,340
Axles	6,714	4,446	2,207
Constructional steel work	210,557	142,286	102,215
Wire nails, nuts, bolts, etc	56,444	31,778	22,684
Cast iron pipe	270,001	199,433	153,116
Other castings	19,087	13,979	11,479
Steel tubes	67,412	49,003	52,040
Total	4,555,016	3,217,169	3,274,825

Steel Prices Low in Belgium

Reduced Trade With Far Eastern Markets Affects Belgian Exports Adversely—Record Year for Production but Competition Forces Prices Down—Large Concerns Merging

European Staff Special

FAVORABLE circumstances at the beginning of 1927 led Belgian industrial leaders to believe the year would bring them nearer to normal prosperity. Legal stabilization of the franc had calmed the atmosphere, both politically and financially. Belgium, however, together with Luxemburg with whom she is allied economically, depends mostly for her activities on export trade, and this is particularly true with regard to the iron and steel industries. The greater portion of the output of Belgium and Luxemburg finds an outlet in Great Britain, Scandinavia, the Far East, South America, and even the northern continent of America. Thus world conditions affect the prosperity of Belgium and her neighbor.

The heavy buying from Great Britain, which continued well into 1927, gradually subsided as the British furnaces were resuming their activities. As time went on, British iron and steel was retrieving its place in dominion and foreign markets. The rebate scheme instituted in September by the British steelmakers tended to restrict imports of foreign steel into their country. These factors naturally affected Belgian exports unfavorably, but not to the extent that might have been expected because lower costs of production in Belgium and Luxemburg considerably assist these countries in competing against Great Britain. However, toward the end of the year British pig iron and sheets did appear in Belgium.

China and Japan Poor Buyers

The serious disturbances that occurred in China substantially restricted Belgian exports of merchant steel, beams and wire rods. Toward September a slight revival of business in that direction was noted. The financial crisis in Japan in March and April also restricted exchanges until the end of the year, when Japanese importers again were in a position to purchase wire rod and merchant bars. Nevertheless, the markets of the Far East were dull almost throughout the year. South America was a less prominent buyer than in previous years, but it should be borne in mind that heavy buying had taken place when the Belgian franc was low in value, and large stocks had been constituted at the time. However, the volume of Belgian and Luxemburg exports during the past year exceeded the figures of 1926 by about 23 per cent, owing particularly to heavy British purchases early in the year.

Throughout the year Belgian furnaces operated nearly to capacity. The average monthly output of pig iron in the first ten months was 312,150 metric tons, and in October production reached 322,230 tons. At certain periods all furnaces were in blast and most of the time 55 out of the 56 were operating. The average monthly output of steel was 308,775 metric tons. Both the pig iron and steel figures exceeded 1926, but in that year production was restricted by strikes and floods. In production 1927 was a record year. The resulting large tonnage available for export was not disposed of without difficulties.

Belgian Production

(Metric Tons)

Mon. ave.	Coke	Pig iron	Steel ingots and castings	Finished steel
1913	293,585	207,055	205,550	154,820
1924	351,380	236,995	239,585	177,050
1925	342,645	211,875	212,380	151,215
1926	412,995	283,270	281,160	231,810
1927				
Jan.	435,820	316,430	312,590	259,040
Feb.	393,870	292,620	296,830	245,230
March	432,880	314,340	314,625	269,740
April	440,100	309,920	301,070	237,700
May	461,050	318,790	321,140	252,180
June	447,690	302,010	299,770	242,230
July	461,810	319,650	314,140	246,830
Aug.	469,420	316,690	325,690	254,880
Sept.	455,800	308,800	289,870	257,190
Oct.	471,230	322,230	312,060	264,410
Mon. av.	446,965	312,150	308,775	252,945

National Schemes Planned

As a result the average price level in 1927 was low. In January basic bessemer billets were sold at £14 17s and merchant bars at £5 5s; in November billets were £4 4s and bars £4 15s. The particular circumstances under which the Belgian works were operating enabled them to do business at such prices without incurring considerable losses. There is, however, in Belgium a tendency toward retail prices rising generally, and workers recently have been agitating for higher wages. If the cost of living continues to rise the Belgian steelmakers also will have to raise their prices.

A limited number of price agreements existing between producers of certain commodities in Belgium prevented prices of these products from falling below reasonable limits, although the agreements were not always rigorously adhered to. Such was the case for pig iron, wire rod and pipe. During the year protracted negotiations were held between the wire rod manufacturers of Belgium, Luxemburg, France, the Saar and Germany. After many setbacks, which caused considerable variations in export quotations, the international wire rod syndicate was constituted as from Nov. 8. Its duration depends on reorganization of the wire products syndicate which existed previously but was denounced by the Belgian Clouteries et Trefileries de la Paix which demanded an increase of its quota. This could only be granted by reducing the quotas of the other Belgian makers, but the Clouteries de Flandre flatly refused. If an agreement is not reached by the middle of next year the new wire rod syndicate is to be dissolved.

Belgians Demand Large Quotas

Attempts to form international selling syndicates for semifinished and structural steel also have been checked by demands of certain Belgian steelmakers who insist upon being granted a quota corresponding to production figures considerably in excess of those they attained in 1926. The position of the dissidents is strong and they might keep out of future agreements if their requests are not granted. There is a strong tendency in Belgium toward amalgamation of large concerns such as Sambre et Moselle and Chatelineau, Athus-Grivegnee and Angleur, Ougree-Marihaye and Alliance-Monceau, and others are being mentioned. The financial results of many iron and

(*Concluded on Page* 116)

Italy Is Planning For Future

National Production Officially Encouraged—Industrial Depression Accompanies Lira Appreciation—Iron Ore Resources and Hydro Electric Plant Being Developed

European Staff Special

INSPIRED by strong leadership, Italy is striving more to develop national industries and restrict importations. This is particularly the case for iron and steel, shipbuilding, the automobile and electrical industries. Iron and steel production was greatly stimulated in 1924 and attained its highest point in 1925, but this has not been maintained. Average monthly output of steel in 1925 was 146,500 metric tons; it was slightly less in 1926, and dropped to about 123,000 tons in 1927. Pig iron production reached its highest point in 1926, when the monthly average was 42,000 tons; it dropped slightly in 1927 but remained higher than any year previous to 1926.

The falling off of trade began in the summer of 1926 and reached an acute stage last year. The decrease of iron and steel business is only one aspect of the economic crisis caused in Italy by the attempt to improve the national currency. As usual, the new policy was accompanied by tightness of credit and certain restrictions in commercial transactions, which curtailed consumers' ability to buy. The government, realizing the necessity of maintaining an iron and steel industry, endeavored to stimulate production by passing orders to the shipyards, contracting for the railroads, and encouraging electrification schemes. These contracts, however, did not suffice to employ works satisfactorily.

Italian Production

(Metric Tons)

	Iron ore	Coke	Pig iron	Steel ingots and castings
1913.....	603,115	498,440	426,755	933,500
1918.....	694,675	371,405	313,575	992,530
1919.....	613,095	302,735	239,710	731,825
1920.....	389,965	95,725	88,070	773,760
1921.....	285,460	34,020	61,380	700,435
1922.....	314,410	167,955	157,600	982,520
1923.....	360,100	275,235	236,255	1,141,760
1924.....	237,670	309,970	303,970	1,358,855
1925.....	513,250	512,265	481,800	1,785,530
1926.....	522,785	.....	513,425	1,779,159
1927*....	.....	.....	500,000	1,500,000

*Estimated.

Toward September, manufacturers were hoping that conditions would improve, but as the year drew to a close they were disappointed. Business remained dull and the domestic market was unable to resist invasions of foreign steel, particularly plates. Steel prices, controlled by the consortium of steelworks, followed a downward trend. At the beginning of November the price of billets was fixed at 860 lira ($47) per metric ton, and beams were 890 lira ($48.60); 4-millimeter sheets, which were 1350 lira ($73) in the early summer, were 1100 lira ($60) in November.

The difficulties under which the Italian industries now are laboring are of a character that dispel any prospect of an immediate revival. The country, however, holds a valuable asset in its iron and steel plant. It can be reasonably assumed that although manufacturers still may have to face a period of depression well into 1928, the gradual re-adaptation to the present monetary conditions will bring a return to normal.

Iron Imports Restricted

In 1926 the management of the Ilva, one of the most important iron and steel concerns in Italy, received instructions from the government to restrict imports to a minimum. A comprehensive program for development of the iron ore mines in the island of Elba was then devised. In co-operation with other iron and steel concerns it was also decided to intensify exploitation of local deposits of fine ores and the use of concentrates from the sulphuric acid plants. These plans were carried out in 1927. Imports of iron ores, which were 309,000 tons in 1925, dropped to 228,000 tons in 1926; the figures for last year are not yet available, but a further drop is expected, and a larger tonnage of Italian ore and concentrates is being used. Exports of ore are forbidden.

There are in Italy 12 blast furnace stacks of modern design capable of producing 900,000 tons of pig iron annually. The requirements of the country in pig iron are estimated at about 600,000 tons, for which 1,100,000 tons of ore would be required. It is believed that this tonnage of ore can be found in Italy for several years to come. In 1925 and 1926 the combined output of iron ore and iron pyrites in Italy was about 985,000 metric tons. It would thus be no more necessary to import foreign pig iron, excepting a small tonnage of special grades. At the end of 1927 imports of pig iron from Great Brittain and France were on the decline. Development of hydroelectric power is being actively pursued in Italy and electrical processes of manufacture of iron and steel are widely applied.

Belgian Steel Prices Low

(*Concluded from Page* 115)

steel concerns as they will be disclosed in 1928 probably will not be brilliant, and they may experience a difficult period if labor succeeds in its campaign to increase wages. An exception may be made for the large producers of rails. Thanks to the smooth working of the European rail makers' association, known as the Erma, rail business has been remunerative. It is believed, however, that the eventual formation of other international selling syndicates will result in better prices, and that the economies realized in coming mergers of large firms will reduce production costs.

Belgian steel producers feel their position is reasonably well assured in the world's market by current developments.

BELGIAN AND LUXEMBURG IMPORTS AND EXPORTS OF PRINCIPAL PRODUCTS

(Metric Tons)

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Steel*	Pig iron	Steel*
1925.....	27,095	15,860	8,060	242,325
1926.....	27,505	27,265	13,105	304,075
1927				
Jan.	30,253	23,086	17,742	332,921
Feb.	21,876	20,793	8,191	367,723
Mar.	26,172	33,192	10,713	440,445
Apr.	27,351	26,579	15,363	372,296
May	27,843	24,229	10,766	371,211
June	34,966	28,961	10,474	359,563
July	35,344	22,696	13,118	373,255
Aug.	42,913	27,824	11,368	436,631
Sept.	28,388	27,726	13,665	355,720
Mon. ave.	30,565	26,120	12,380	378,865

*Includes ingots, semifinished steel, bars, beams and shapes, rails, hoops and bands, plates, sheets and tinplates, structural work, wire products, tubes, scrap and sundries.

Eastern Europe Is Progressing

Polish and Czech Production Making Rapid Strides—Export Business Is Regulated—Closer Working With Steel Entente Expected —Russian Output Behind Schedule

European Staff Special

EASTERN European countries generally have seen improvement of their conditions in 1927. In Czecho-Slovakia, Poland and Austria, both pig iron and steel production have exceeded previous years; in Hungary the output of the blast furnaces topped 1926 by about 35 per cent. The progress in some cases is remarkable and indicates that these countries are bent upon themselves producing the iron and steel their industries require.

Pig iron output of Poland increased practically without a break from January to August. Steel production also increased, as can be seen in the accompanying table. In Upper Silesia, manufacturers of agricultural implements were unable to meet the demand.

A further strong sign of the increasing activities of the Polish iron and steel industries was that imports of iron ore in the first eight months of last year were 455,120 metric tons, against 153,907 tons in the corresponding period of 1926. The greater part of these imports comes from Russia, followed by Sweden and Germany.

Toward the middle of last summer additional stacks and steel furnaces were put into commission. The volume of orders received in September was expanding, although there was a decline of government contracts. At the beginning of the fall a revival in the building trades resulted in a substantial gain in demand for structural steel.

Polish Works Syndicated

In 1927 the works of Upper Silesia succeeded in developing their exports, but felt the depression of world prices. In September, 75 per cent of the Upper Silesian iron and steel business was for home consumption and 25 per cent for export. To eliminate ruinous competition, Polish blast furnace operators are grouped into a syndicate. This body is considering organizing the iron and steel export trade, developments being expected in 1928. Representatives of the iron and steel works of Poland, Czecho-Slovakia, Austria and Hungary met at Dresden at the end of 1927 and agreed to maintain the understanding by which these countries undertake not to compete in each other's territory.

Several Polish concerns have made substantial profits in the past financial year and are able to increase their reserves and declare dividends ranging from 15 to 25 per cent.

Polish steelmakers have not joined the continental steel entente. They ask protection for their home market and a quota of 500,000 tons of steel for export. It has been found impossbile to grant these requests, but negotiations continue and an agreement may be arrived at this year.

Monthly Production in Eastern Europe

(Metric Tons)

POLAND

Mon. ave.	Pig iron	Raw steel
1913	85,927	138,376
1926	27,289	65,188
1927		
Jan.	42,314	98,481
Feb.	42,633	94,255
March	47,673	114,415
April	47,873	97,487
May	47,994	96,514
June	46,749	101,156
July	51,382	111,428
Aug.	56,812	113,151

Estimated Monthly Average, 1927 By Countries

Russia	248,225	295,065
Czechia	104,165	137,500
Poland	48,685	105,410
Austria	35,560	45,300
Hungary	21,665	27,055

Industrial activities in Czecho-Slovakia have resulted in a heavy increase of steel requirements. Output of steel in 1927 is estimated at 1,650,000 metric tons over 200,000 tons in excess of the quota allotted Czech steelmakers by the steel entente. To the end of 1927 the situation of the steel industry was satisfactory and the works were operating to capacity.

Although export trade has tended to decrease, there was throughout the year a regular current of business with Germany, Austria, Russia, Rumania, and Italy. Iron and steel products of Czecho-Slovakia continue to be exported by a joint sales bureau.

Notwithstanding relatively unfavorable geographical position, Czecho-Slovakia exports about 30 per cent of its production. Steelmakers are grouped into a syndicate that fixes prices according to three scales, one for domestic business, one for direct export business, and one that covers export the finished product. This arrangement seems to have worked out satisfactorily thus far.

Hungary Adds One Furnace

The principal producer in Austria is the Oesterreichisch-Alpine Montangesellschaft. This concern, now partly controlled by the Vereinigte Stahlwerke, A. G., the German steel trust, produces practically all the pig iron, about 68 per cent of the raw steel and 58 per cent of the finished steel.

Austria's exports have exceeded her imports. In the first quarter of 1927 Austrian exports were 17,591 metric tons of pig iron and 57,682 tons of steel products, while imports were 5386 tons and 21,250 tons respectively. Since Jan. 1, 1927, the Alpine Montangesellschaft has been a member of the continental steel entente, with a quota of 411,000 tons of raw steel which was not exceeded last year, the country's total output being estimated at 535,000 metric tons. The increase in the pig iron output of Hungary last year was due to addition of a new blast furnace, of which five are now in operation.

Reports from Russia indicate that the heavy industries are experiencing a severe crisis due to inadequate plant and lack of capital. In the financial year 1926-27 steel output was about only 70 per cent of prewar.

However, the output from October, 1926, to June, 1927, was 2,655,000 metric tons, an increase of 25 per cent over the previous year. Output of pig iron showed an increased of 39 per cent, with 2,226,000 tons. These tonnages do not meet requirements of the country.

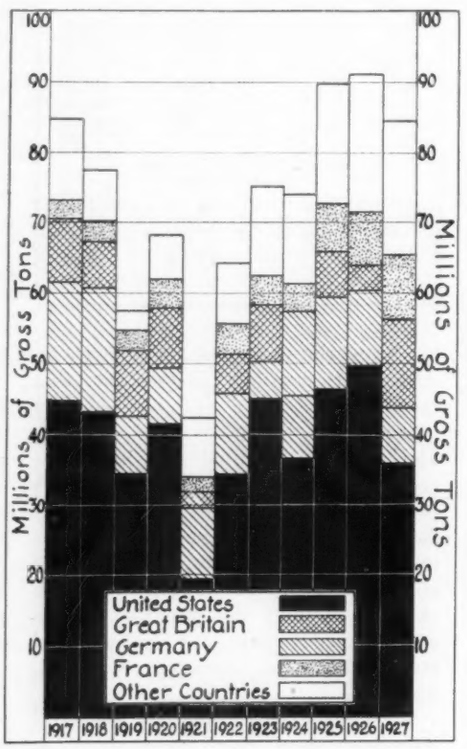
Production of iron and steel in the Balkan states and the Near East continues negligible. Conditions of consumption in these areas have not been such as to warrant increased attention by European producers.

World Output Makes Big Gain

Peak Production Reached in Pig Iron and Steel—Hundred Million Steel Output in Sight—Year's Increase Due to Great Britain and Germany—America Loses Lead Over Europe

MORE steel was used in 1927 than at any time since the discovery of that metal. This fact is evidenced by the tonnage produced which, during the year, attained unprecedented figures both for pig iron and steel. At the same time, the hand-to-mouth buying policy that characterized most of the world markets the past year supports the belief that stocks at the end of the year were not considerably greater than at the end of 1926. It is noteworthy that the actual increase of consumption was principally limited to two European countries, Germany and Great Britain, while both output and consumption decreased in the United States. According to the statistics compiled by IRON TRADE REVIEW through the aid of its world-wide ramifications, and given in the accompanying tables, 84,790,000 gross tons of pig iron and 98,904,000 gross tons of steel ingots and castings were produced the world over in 1927; this compares with 77,450,000 tons of pig iron and 91,559,000 tons of steel in 1926, 75,670,000 tons of pig iron and 89,202,000 tons of steel in 1925, and 77,714,000 tons of pig iron and 74,687,000 tons of steel produced in the prewar year of 1913.

The gain in the output of steel last year was 8 per cent. The United States was roughly 4,080,000 tons down, and produced 45 per cent of the world's output. The countries of Europe increased their production by 25 per cent, passing from about 40,000,000 tons in 1926 to 51;000,000 tons in 1927. Of that increase, Germany is responsible for 3,850,000 tons and great Britain for 5,650,000 tons. The gain made by Great Britain is only natural, following a year when that country's activities were nearly at a standstill for seven or eight months. Even so, Britain's output did not reach the figures of 1917 and 1918, but last year's steel tonnage was the highest since the end of the war. The 31 per cent increase in Germany's production of steel came more as a surprise. About three-quarters of the output was consumed in the domestic market as a result of the intense activities which were practically maintained throughout the year in the country.



COMPARISON OF STEEL TONNAGES BY PRINCIPAL COUNTRIES, SHOWING UNITED STATES SLIGHTLY UNDER HALF WORLD'S PRODUCTION

The five original member countries of the European steel entente—Germany, France, Belgium, Luxemburg and the Saar—together produced 32,000,000 gross tons, compared with 27,677,000 tons in 1926. The tonnage allowed these countries last year, in gross tons, was 28,450,000, thus roughly 3,500,000 tons were produced in excess of the quotas fixed by the entente, and practically the whole of that excess tonnage was produced by Germany. Excepting France, Italy, and Sweden, which did not quite reach their steel output of 1926, and one or two countries whose output remained on about the same level, most of the other countries of Europe improved on their 1926 production. In proportion to their capacity of production, special mention should be made of Poland and Czecho-Slovakia, whose output increased about 60 per cent and 23 per cent respectively. Russia's gain of about 440,000 tons is small in proportion to that country's arrears with respect to prewar figures. Apart from Europe and America, a substantial gain was effected by Japan and Australia.

The gain in pig iron production last year over 1926 was 9.4 per cent. The share of the United States in the world's output dropped to 43 per cent of the total. Great Britain and Germany again were responsible for the increase of production in Europe. In general, the variations of the output of pig iron in the different countries of the world ran along almost parallel lines with those pertaining to steel. Table II shows exports and imports of iron and steel of the five principal countries. The movement of exchanges was substantially larger in 1927 than in the previous year. Among the most salient features are the return of Great Britain on export markets, falling off of German exports, but principally the considerable increase in French exports. In the first nine months

of 1927 the French exports of pig iron, semifinished and merchant steel to Germany and Great Britain were about twice as large as in the corresponding period of 1926. France is alive to the fact that the future of her steel industry now largely depends upon export trade, and the opportunities offered since 1926 to capture world markets have not been overlooked. British imports tended to decrease at the end of 1927, whereas exports were on the up-grade. The situation in Germany was the reverse.

The outlook at the opening of the new year is uncertain. On the one hand there are strong reasons to believe that production may increase in the United States. In Europe, Great Britain is striving to make up for lost time; certain industrial leaders in Germany are confident that production should continue at its present rate; the industrial crisis in France appears to have passed the acute stage and conditions in that country, as well as in Italy, should become stabilized. Russia plans further progress, while Japan and Australia are bent on more production. The potential requirements of the world for steel are large and sufficient to absorb a considerable tonnage. On the other hand, certain factors may interfere with the free play of economic forces. Such are the coming elections in the United States and in France, political disturbances which still are smouldering in certain parts of the world, while the outlook in Germany is diversely appreciated and the Far East remains an unknown quantity. However, given favorable circumstances, the steel output in 1928 may easily reach the hundred million mark.

Table I

The World's Production of Iron and Steel

Before and Since the War—Gross Tons

Pig Iron

	1927	1926	1925	1924	1923	1922	1921	1920	1919	1913
United States	36,350,000	39,101,000	36,370,000	31,077,000	40,026,000	26,851,000	16,506,000	36,401,000	30,579,000	30,653,000
Canada	825,000	776,000	596,000	619,000	909,000	402,000	616,000	999,000	863,000	1,015,000
Great Britain	7,350,000	2,442,000	6,262,000	7,307,000	7,440,000	4,902,000	2,616,000	8,035,000	7,398,000	10,260,000
France	9,150,000	9,281,000	8,358,000	7,570,000	5,346,000	5,147,000	3,308,000	3,380,000	2,374,000	5,126,000
Belgium	3,685,000	3,345,000	2,501,000	2,798,000	2,114,000	1,587,000	858,000	1,099,000	247,000	2,445,000
Luxemburg	2,675,000	2,472,000	2,325,000	2,123,000	1,384,000	1,652,000	955,000	682,000	608,000	.....
Italy	490,000	505,000	474,000	299,000	232,000	155,000	60,000	87,000	236,000	420,000
Spain	500,000	450,000	520,000	489,000	394,000	207,000	341,000	247,000	289,000	418,000
Sweden	420,000	449,000	455,000	526,000	297,000	271,000	314,000	477,000	501,000	730,000
Germany	12,850,000	9,489,000	10,014,000	7,687,000	4,857,000	9,246,000	7,719,000	6,931,000	5,564,000	19,000,000
Austria	420,000	328,000	374,000	263,000	337,000	316,000	220,000	98,000	61,000	2,344,000
Czechia	1,230,000	1,071,000	1,147,000	967,000	804,000	330,000	568,000	725,000	652,000	.....
Poland	575,000	322,000	310,000	331,000	512,000	472,000	437,000	42,000	35,000	.....
Hungary	255,000	185,000	92,000	114,000	123,000	97,000	70,000	.....	.....	.....
Russia	2,930,000	2,388,000	1,521,000	746,000	379,000	183,000	112,000	113,000	112,000	4,563,000
Japan	1,225,000	1,160,000	917,000	820,000	796,000	691,000	646,000	718,000	784,000	236,000
China	200,000	400,000	380,000	200,000	175,000	180,000	126,000	125,000	166,000	239,000
India	1,000,000	900,000	888,000	877,000	614,000	340,000	371,000	312,000	320,000	204,000
Australia	510,000	442,000	439,000	416,000	330,000	84,000	352,000	344,000	254,000	47,000
Saar territory	1,760,000	1,599,000	1,427,000	1,367,000	1,005,000	1,138,000	1,131,000	956,000	.....	.....
Miscellaneous	390,000	345,000	300,000	205,000	110,000	100,000	75,000	181,000	75,000	100,000
World Total	84,790,000	77,450,000	75,670,000	66,846,000	66,846,000	54,351,000	37,401,000	61,846,000	51,118,000	77,714,000

Steel Ingots and Castings

United States	44,214,000	48,294,000	45,394,000	37,932,000	44,944,000	33,603,000	19,785,000	42,133,000	34,671,000	31,301,000
Canada	900,000	777,000	756,000	661,000	884,000	481,000	669,000	1,110,000	928,000	1,043,000
Great Britain	9,200,000	3,560,000	7,385,000	8,201,000	8,482,000	5,881,000	3,703,000	9,067,000	7,894,000	7,664,000
France	8,100,000	8,295,000	7,327,000	6,791,000	5,029,000	4,464,000	3,010,000	3,002,000	2,151,000	4,614,000
Belgium	3,645,000	3,320,000	2,508,000	2,829,000	2,260,000	1,540,000	752,000	1,233,000	328,000	2,428,000
Luxemburg	2,420,000	2,208,000	2,053,000	1,857,000	1,182,000	1,372,000	842,000	576,000	366,000	.....
Italy	1,475,000	1,752,000	1,757,000	1,337,000	1,124,000	966,000	689,000	762,000	720,000	919,000
Spain	620,000	569,000	616,000	531,000	456,000	230,000	394,000	200,000	237,000	238,000
Sweden	465,000	481,000	467,000	493,000	267,000	306,000	208,000	430,000	483,000	582,000
Germany	15,975,000	12,145,000	12,000,000	9,678,000	6,204,000	11,527,000	9,837,000	9,130,000	6,767,000	18,632,000
Austria	535,000	473,000	462,000	371,000	500,000	484,000	354,000	233,000	164,000	2,585,000
Czechia	1,625,000	1,319,000	1,476,000	1,200,000	984,000	640,000	903,000	957,000	773,000	.....
Poland	1,245,000	777,000	779,000	667,000	1,114,000	979,000	841,000	70,000	16,000	.....
Hungary	320,000	320,000	227,000	235,000	278,000	253,000	163,000	61,000	32,000	.....
Russia	3,485,000	3,052,000	2,087,000	1,122,000	713,000	351,000	311,000	158,000	196,000	4,181,000
Japan	1,635,000	1,475,000	1,279,000	1,106,000	973,000	932,000	901,000	861,000	850,000	300,000
China	50,000	50,000	50,000	50,000	50,000	50,000	47,000	51,000	5,000	100,000
India	555,000	520,000	449,000	335,000	215,000	150,000	183,000	156,000	187,000	.....
Australia	425,000	338,000	351,000	306,000	200,000	220,000	209,000	168,000	178,000	.....
Saar territory	1,890,000	1,709,000	1,554,000	1,423,000	981,000	1,242,000	905,000	664,000	.....	.....
Miscellaneous	125,000	125,000	225,000	175,000	175,000	125,000	80,000	80,000	50,000	100,000
World Total	98,904,000	91,559,000	89,202,000	77,300,000	77,300,000	65,796,000	44,586,000	71,102,000	56,996,000	74,687,000

German figures in 1913 are for pre-war territory; the Saar is still included in the 1919 figures of Germany. Austrian figures in 1913 include the major portion of Czechia and Hungary. Japan's figures include Manchuria and Corea.

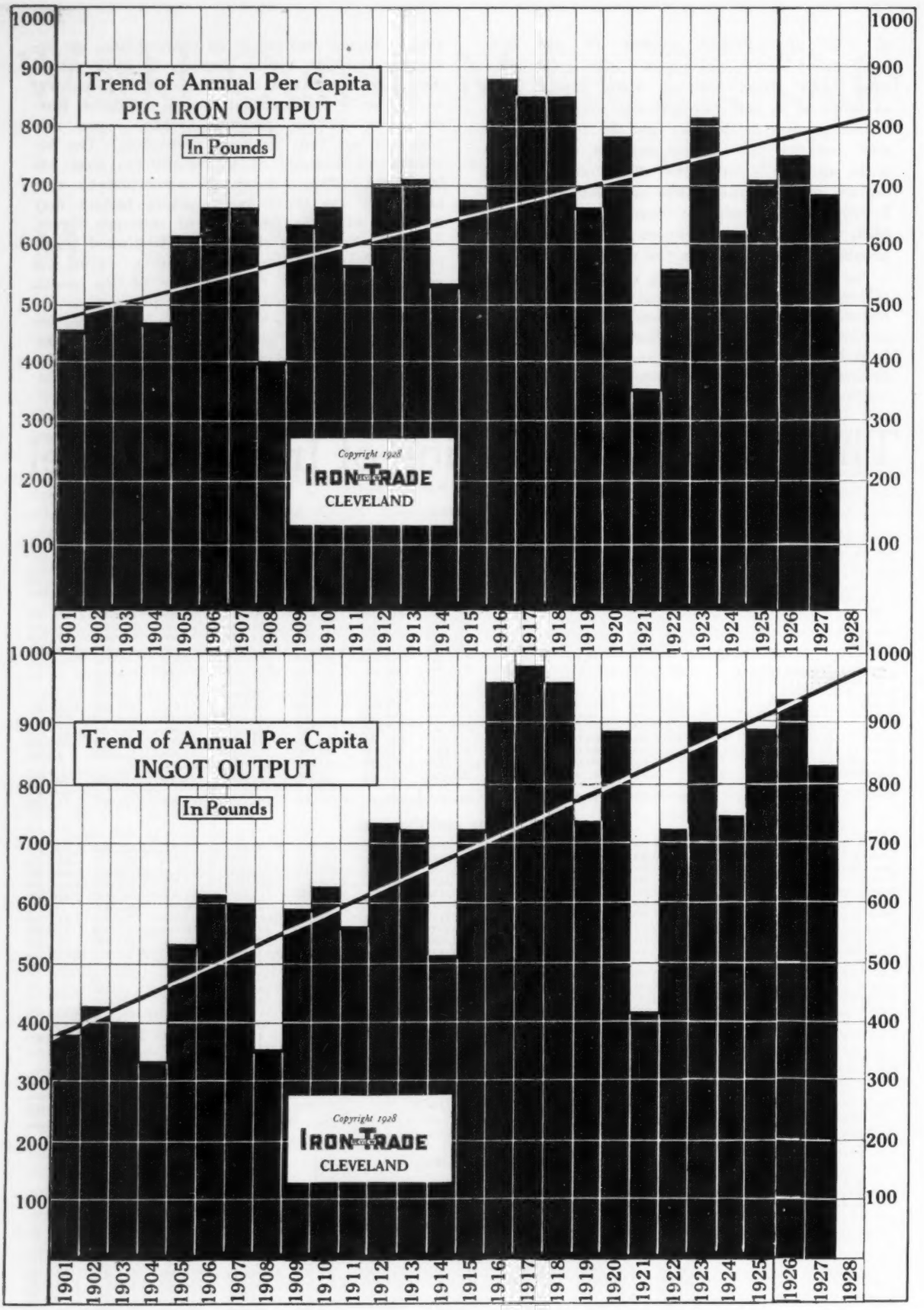
Table II

Exports and Imports of the Principal Countries

Gross Tons — Scrap Eliminated

	Exports					Imports				
	1927	1926	1925	1924	1913	1927	1926	1925	1924	1913
United States	1,900,000	2,062,000	1,820,000	1,827,000	2,648,000	700,000	1,024,000	856,000	511,000	273,000
Great Britain	4,200,000	2,988,000	3,731,000	3,851,000	4,969,000	4,500,000	3,740,000	2,721,000	2,429,000	2,231,000
Germany (a)	4,250,000	4,823,000	3,210,000	1,533,000	6,200,000	2,160,000	1,038,000	1,181,000	1,260,000	300,000
France (b)	5,675,000	4,179,000	3,985,000	2,805,000	640,000	146,000	192,000	186,000	717,000	185,000
Belgium & Luxemburg (c)	4,525,000	3,667,000	3,151,000	3,356,000	1,550,000	620,000	600,000	531,000	557,000	874,000
Total	20,550,000	17,719,000	15,897,000	13,372,000	16,007,000	8,126,000	6,594,000	5,475,000	5,474,000	3,863,000

(a) 1927 figures include reparations deliveries,—1913 includes Luxemburg.
(b) Includes Saar figures since Jan. 10, 1925. (c) Includes Luxemburg, except for 1913.


Trend of Annual Per Capita
PIG IRON OUTPUT
In Pounds
Copyright 1928
IRON TRADE REVIEW
CLEVELAND
Trend of Annual Per Capita
INGOT OUTPUT
In Pounds
Copyright 1928
IRON TRADE REVIEW
CLEVELAND
1000
900
800
700
600
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400
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100
1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928

Per Capita Production Is Smaller

Pig Iron Output For Each Person 690 Pounds in 1927

Ingots and Castings Decline To 835 Pounds For Year

NINETEEN twenty-seven was a year of moderately reduced operations in the iron and steel industry. During the year the per capita production of steel ingots and castings dropped to the lowest level since 1924. The total was 835 pounds and this compared with 924 pounds in 1926, with 881 pounds in 1925 and with 746 pounds per capita in 1924. The per capita production in 1926 still stands as the peak for any peace-time year.

Pig iron production in the country during 1927 also declined and the per capita output was lower. The total per capita production for pig iron in 1927 was 690 pounds compared with 702 pounds in 1926 and 713 pounds in 1925. In 1924 the per capita output of pig iron was 618 pounds and in 1921 it was 344 pounds.

The figures disclose that the per capita production of ingots and castings was 145 pounds greater than that for pig iron. This spread compares with a difference of 172 pounds between pig iron and ingots in 1926 and about the same figure in 1925. It is slightly greater than the margin of 140 pounds of ingots over pig iron in 1924 and much greater than the spread of 105 pounds in 1923. In 1921 there was a spread of only 65 pounds and in 1913 the difference was only 11 pounds in favor of steel ingots and castings.

In recent years there has been a steady gain in the relative use and production of ingots compared with pig iron. This chiefly reflects the widespread adoption of the open-hearth process in producing ingots, which makes possible a more liberal use of scrap metal. In 1927 the margin was reduced rather sharply and the reason for this probably is to be found in the depressed prices of pig iron which encouraged its use in open-hearth furnaces.

The aggregate estimated production of steel ingots for 1927 is 43,034,000 tons. The estimated output of steel castings is 1,180,000 tons, making a total for ingots and castings of 44,214,000 tons. This compares with a total of 48,294,000 tons in 1926 and with 45,394,000 tons in 1925. As shown by the accompanying chart the per capita output of ingots in 1927 dropped well below the computed normal line. In 1926 the per capita production was almost exactly at normal.

The estimated output of coke and charcoal pig iron in 1927 was 36,511,000 tons which compared with 39,372,000 tons in 1926 and with 36,700,000 tons in 1925. In 1926 the per capita production rose almost to the computed normal line but in 1927 the per capita production stepped down to a point well below normal.

The population of the United States as of July 1, 1927 estimated by the United States bureau of census, was 118,628,000. This was an estimated increase of 1,492,000 over 1926 compared with an estimated increase of 1,758,000 during the preceding year. The method of estimating the population used by the bureau of census, is one wherein birth and death and immigration and emigration figures are computed.

The greatest prewar year per capita production of steel ingots and castings was in 1912 when there was a total of 736 pounds. That figure was not exceeded until war activities had stimulated production per capita to 950 pounds in 1916. The peak for all time was reached in 1917 with 987 pounds. The year 1913 brought the peak of pig iron production per capita to 717 pounds which held the record until 1916 when there was an output per capita of 876 pounds.

All Steel Production Per Capita 1878-1927

Year	Population in thousands	Steel ingots and castings output in gross tons thousands	Output per capita pounds
1927	118,628	44,214	835
1926	117,136	48,294	924
1925	115,378	45,394	881
1924	113,727	37,932	746
1923	111,693	44,943	911
1922	109,893	35,603	726
1921	108,445	19,783	409
1920	106,422	42,132	887
1919	105,003	34,671	739
1918	103,587	44,462	961
1917	102,172	45,060	987
1916	100,757	42,773	950
1915	99,342	32,151	724
1914	97,927	23,513	509
1913	96,512	31,300	725
1912	95,097	31,251	736
1911	93,682	23,676	565
1910	92,174	26,094	634
1909	90,556	23,955	592
1908	88,939	14,023	353
1907	87,320	23,362	599
1906	85,702	23,398	611
1905	84,085	20,023	533
1904	82,467	13,859	335
1903	80,848	14,534	402
1902	79,231	14,947	422
1901	77,612	13,473	375
1900	75,995	10,188	300
1888	59,974	2,899	108
1898	72,947	8,932	274
1897	71,592	7,156	223
1896	70,254	5,281	168
1895	68,934	6,114	198
1894	67,632	4,412	146
1893	66,349	4,019	135
1892	65,086	4,927	169
1891	63,844	3,904	121
1890	62,948	4,277	152
1889	61,298	3,385	123
1888	59,974	2,889	108
1887	58,680	3,339	127
1886	57,404	2,562	99
1885	56,148	1,711	68
1884	54,911	1,550	63
1883	53,693	1,673	69
1882	52,495	1,736	74
1881	51,316	1,588	69
1880	50,156	1,247	55
1879	48,886	935	42
1878	47,598	732	34

Pig Iron Production Per Capita 1878-1927

Year	Population in thousands	Pig iron output in gross tons thousands	Output per cap. pounds
1927	118,628	36,511	690
1926	117,135	39,372	752
1925	115,378	36,700	713
1924	113,727	31,406	618
1923	111,693	40,361	806
1922	109,893	27,219	554
1921	108,445	16,688	344
1920	106,422	36,926	777
1919	105,003	31,015	661
1918	103,587	39,054	843
1917	102,172	38,621	846
1916	100,757	39,434	876
1915	99,342	29,916	677
1914	97,927	23,332	533
1913	96,512	30,966	717
1912	95,097	29,726	700
1911	93,682	23,649	564
1910	92,267	27,303	663
1909	90,556	25,795	638
1908	88,939	15,936	400
1907	87,320	25,781	661
1906	85,792	25,307	661
1905	84,085	22,992	612
1904	82,467	16,497	462
1903	80,848	18,009	500
1902	79,231	17,821	504
1901	77,612	15,878	458
1900	75,995	13,789	406
1899	74,318	13,620	409
1898	72,947	11,773	361
1897	71,592	9,652	302
1896	70,254	8,623	274
1895	68,934	9,446	306
1894	67,632	6,657	220
1893	66,349	7,124	239
1892	65,086	9,157	315
1891	63,844	8,279	289
1890	62,948	9,202	327
1889	61,298	7,603	277
1888	59,974	6,489	242
1887	58,680	6,417	244
1886	57,404	5,683	221
1885	56,148	4,044	161
1884	54,911	4,097	166
1883	53,693	4,595	191
1882	52,495	4,623	197
1881	51,316	4,144	188
1880	50,156	3,835	171
1879	48,886	2,741	125
1878	47,598	2,301	108

Minnesota Ore Reserves and Assessed Values

Ore in Ground

County	May 1, 1926 Tons	May 1, 1926 Assessed value	May 1, 1927 Tons	May 1, 1927 Assessed value
St. Louis	1,091,326,675	$239,358,688	1,066,304,867	$227,847,971
Itasca	144,917,374	16,980,655	137,631,156	15,904,766
Crow Wing	50,642,663	3,475,022	49,203,892	3,315,283
Totals	1,286,886,712	$259,814,365	1,253,139,915	$247,068,020
Ore in Stockpiles				
St. Louis	9,855,964	$ 7,297,808	9,036,625	$ 6,269,616
Itasca	262,063	290,460	207,961	234,425
Crow Wing	447,866	454,810	448,700	392,600
Totals	10,565,893	$8,043,078	9,693,286	$6,896,641
Total Merchantable Ore in Ground and Stockpiles				
St. Louis	1,101,182,639	$246,656,496	1,075,341,492	$234,117,587
Itasca	145,179,437	17,271,115	137,839,117	16,139,191
Crow Wing	51,090,529	3,929,832	49,652,592	3,707,883
Totals	1,297,452,605	$267,857,443	1,262,833,201	$253,964,661

The assessments as given in this table do not include those for surface values, structures or improvements.

Ore Industry Operating More Efficiently

(*Continued from Page* 28)

The Mangan No. 1 mine comprises 80 acres and the lease was acquired from the Mangan Iron & Steel Co. This formerly was operated as an underground property, and was shut down in 1919.

The Hillcrest mine was stripped hydraulically in 1915 and was operated as an open pit until shut down in 1916. The Arko is a small underground mine developed during the war. The Manganiferous company is check drilling these two properties. The company began operations on the Cuyuna range in 1924 when it leased the Cuyuna Mille Lacs mine, located on an 80 acre tract, and renamed it the Louise, from which substantial shipments have been made.

At the Bristol mine, Menominee range, of Oglebay, Norton & Co. a new air shaft has been built in solid ground to supply air to the underground workings. This replaces No. 1 shaft which has been used for that purpose, but which it was feared might be lost by caving. This company in 1927 shipped from various properties which it operates 2,036,000 tons of ore, 680,000 tons of which was manganiferous grades. It leased two additional iron ore properties at Iron River, Mich., Menominee range.

In view of the generally low price of iron ore, the constant aim of mine operators has been to establish operating economies wherever possible. There is abundant evidence of remarkable increases in labor productivity, which accounts in large measure for the fact that mine wages have been maintained at a high level, and iron mine operators do not have a labor problem, such as exists in the coal industry. In the ten years, 1910 to 1920, the average number of men employed in the mines of St. Louis county, which includes the major share of the Minnesota mining industry, was 15,200. In 1926 the mine inspector's report shows only 9225 were employed.

One of the main reasons for the gain in productivity is the improvement in mine equipment, both surface and underground, though a large share of the increase is accounted for by the fact that operators have been forced to concentrate their efforts on ore bodies most easily and economically worked. Underground men produce today about 50 to 100 per cent more tonnage than 10 years ago, while in open pit mining, with large shovels, superheaters, new electrical equipment and important new mechanical devices for handling trackage and dirt even greater efficiency has been established.

Development of new equipment has slowed down. In the past year nothing of a distinctly new character was brought out. One of the leading operators sought to take another step in the construction of still larger shovels, and found that by increasing its shovel capacity only slightly, it more than doubled the initial cost of the shovel such as it proposed to build. The tendency is not toward larger shovels, but, if anything, toward smaller and more mobile units, equipped with caterpillars, and adapted to faster work. More locomotives are being equipped with superheaters and boosters.

The most noticeable feature in regard to new equipment is the more general use of slushers and tugger hoists in the underground mines, and the increasing size of them. A few years ago the removal of ore from the mine face and the loading of it on cars for hoisting was considered one of the most difficult problems of the industry. Today this problem is practically solved in the use of electrically operated slushers, or scrapers. The majority of underground mines are so equipped. Large gains in productivity are claimed for these units by the operators, relieving workers from much of the drudgery of shoveling, and releasing many of them for other occupation.

Eight additions were made in 1927 to the fleet of American ore carriers, namely the COULBY 13,000 tons capacity; L. E. BLOCK, 12,500 tons; HUMPHREY, HOBSON, MCLAUGHLAN, 11,500 tons each; HARVEY and AFFLECK, 11,300 tons each, and the MACHETH 5500 tons. This added 88,100 gross tons carrying capacity, bringing the total for the fleet of 358 to 2,909,800, a net increase of 46,900 tons over 1926. Seven vessels with a total carrying capacity of 41,200 tons were eliminated from the fleet, the majority by sale to Canadian interests.

There were no additions in 1927 to the number of loading docks in the upper lakes district, which stands at 22. Great Northern railroad, however, is rebuilding with steel and concrete to No. 1 dock at Superior, Wis. It will have 374 pockets, each of 5620 tons capacity, making it one of the largest on the lakes.

Employes Benefit From Bonds and Insurance

Twenty-seven thousand, 42 per cent, of employes of the General Electric Co. in its service for six months or more are holders of about $30,000,000 worth of G. E. Employes' Security Corp. bonds, an average of approximately $1000 per person, according to J. R. Lovejoy, president of the corporation. The bonds pay 6 per cent interest, but so long as the original holder remains in the employ of the company, an additional 2 per cent is paid by that company. Mr. Lovejoy stated that a new offering of the bonds to employes will be made.

Insurance dividends of approximately $100,000, to be given employes of the company who carry additional insurance under the group plan inaugurated by the company two years ago, have been announced by Gerard Swope, president. This dividend will be distributed in the form of suspended premiums on the policies for two months, January and February, among employes who have carried the additional insurance for 12 months.

Statistics of Consumption

FREIGHT CAR ORDERS

Compiled by IRON TRADE REVIEW

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	32,000	13,000	2,500	21,700	15,000	200	3,180	4,500	1,700	11,000	15,000	8,150	1,695	8,830	14,385
February	22,000	9,000	4,000	12,900	7,750	4,575	60	7,000	200	14,500	9,300	41,350	5,510	12,895	5,960
March	5,000	7,500	1,100	8,750	21,500	2,190	150	5,500	1,400	12,000	42,500	13,150	4,730	8,895	4,630
April	13,500	10,000	1,500	7,000	4,250	31,150	575	20,500	350	31,500	9,800	10,250	5,060	4,615	3,350
May	10,000	6,000	18,000	4,500	15,000	70,165	360	8,000	250	18,250	2,200	511	6,985	448	5,100
June	2,500	15,000	17,000	5,100	8,200	400	1,010	5,500	1,500	13,100	1,785	438	1,835	4,285	7,115
July	1,000	7,000	9,500	2,600	8,650	30,000	2,510	7,000	900	13,700	1,450	886	800	1,265	1,970
August	2,000	1,100	3,000	15,025	13,000	10,000	2,125	7,000	150	1,610	2,780	5,980	2,875	152	856
Sept.	2,000	100	9,000	14,500	1,100	4,000	3,975	3,500	550	10,350	897	27,630	7,905	3,335	357
October	7,500	50	22,500	26,000	42,800	40,900	4,750	6,500	6,500	12,700	1,125	4,885	11,145	2,840	561
November	2,500	500	11,500	37,000	10,000	200	350	2,500	7,000	18,500	5,050	12,720	11,685	3,925	861
December	3,000	2,000	10,400	19,600	1,000	8,000	1,000	2,500	550	23,255	11,600	18,475	16,885	8,990	.....
Total	100,000	71,250	110,000	174,675	148,250	201,780	20,045	80,000	22,050	180,465	103,487	144,425	77,110	60,575	45,145

AUTOMOBILE PRODUCTION

Passenger Cars and Trucks, in United States

Compiled by Department of Commerce

Month	1921	1922	1923	1924	1925	1926	1927
January	.....	89,374	239,302	312,282	230,887	309,544	238,926
February	.....	117,871	271,601	361,762	274,373	364,179	304,753
March	.....	171,487	351,426	375,355	362,116	434,467	394,417
April	.....	219,394	371,460	367,024	421,993	441,306	404,737
May	.....	255,622	385,525	303,699	406,259	421,179	404,097
June	.....	278,876	371,301	241,817	386,887	387,900	321,946
July	176,870	245,755	323,815	260,493	387,214	359,275	268,469
August	181,270	270,838	340,240	276,968	250,574	426,605	308,782
September	158,760	203,927	321,819	287,356	319,770	395,687	260,378
October	148,009	232,824	358,698	284,983	436,225	334,421	219,610
November	116,644	232,923	308,225	224,082	364,347	256,300	133,202
December	79,455	225,285	300,843	199,524	308,711	167,922	.....
Total	861,008	2,544,176	3,944,255	3,495,345	4,149,356	4,298,785	3,259,317

FABRICATED STRUCTURAL STEEL SALES

Computed, in net tons, by Department of Commerce

Month	1922	1923	1924	1925	1926	1927
January	.....	205,200	210,960	173,850	184,440	171,720
February	.....	222,300	213,890	176,900	184,440	219,420
March	.....	265,050	205,100	210,450	209,880	209,880
April	212,500	222,300	193,380	231,800	222,600	238,500
May	197,500	159,600	175,800	207,400	235,320	206,700
June	182,500	148,200	190,450	262,300	232,140	203,520
July	170,000	145,350	202,170	247,050	219,420	308,460
August	170,000	165,300	172,870	237,900	254,400	248,440
September	160,000	148,200	193,380	347,050	187,620	241,080
October	142,500	139,650	193,380	274,500	203,520	263,940
November	122,500	153,900	246,120	216,550	193,980	213,060
December	150,000	228,000	231,470	228,750	225,780	.....
Total	1,507,500	2,203,050	2,428,970	2,714,500	2,553,540	2,521,740

COMMERCIAL STEEL CASTINGS BOOKINGS

Compiled by Department of Commerce

In net tons

Month	1920	1921	1922	1923	1924	1925	1926	1927
January	79,393	33,824	40,968	117,116	64,218	98,703	108,709	101,768
February	84,392	33,444	44,238	103,874	85,885	76,514	95,368	91,797
March	124,678	28,971	56,660	163,280	115,420	75,537	108,626	82,558
April	98,183	24,097	84,419	109,772	84,894	74,541	88,990	78,352
May	96,385	22,903	88,006	108,908	73,110	63,827	80,800	66,736
June	84,441	23,243	100,515	102,046	61,860	62,700	69,835	84,675
July	77,535	19,705	77,775	65,637	49,814	67,881	76,276	72,012
August	75,422	22,791	75,708	67,448	46,663	63,606	68,127	61,380
September	77,383	27,555	110,087	63,383	72,940	59,326	67,363	50,630
October	55,584	37,476	90,768	54,897	79,537	74,283	74,680	49,002
November	48,391	46,405	74,367	55,224	87,058	83,197	70,815	65,634
December	41,379	36,072	82,499	53,894	111,774	100,377	85,747	.....
Total	943,166	356,486	926,010	1,065,479	933,173	900,492	994,836	804,544

Iron and Steel Freight Rates

Finished Material

Per 100 Pounds

PITTSBURGH TO:

Atlanta	$0.58
Baltimore	0.31
Birmingham	0.58
Boston	0.365
Buffalo	0.265
Chattanooga	0.50
Chicago	0.34
Cincinnati	0.295
Cleveland	0.19
Columbus	0.255
Dallas (tin plate .90)	1.02
Denver	1.15
Detroit	0.295
Duluth	0.60
Indianapolis	0.31
Kansas City	0.735
Louisville	0.33
Milwaukee	0.37
Minneapolis and St. Paul	0.60
New Orleans	0.67
New York	0.34
Omaha	0.735
Pacific coast (tin plate)	0.90
Pacific coast (all rail)	1.15
Philadelphia	0.32
South Bend, Ind.	0.32
St. Louis	0.43
Toledo	0.27
Topeka	0.85
Youngstown	0.11

CHICAGO, GARY, INDIANA HARBOR, EVANSTON, JOLIET AND WAUKEGAN TO:

Aberdeen, S. D.	$0.55
Ashland, Wis., and Duluth	0.305
Atlanta	0.58
Beaumont, Tex. (pipe, .49)	0.68
Birmingham	0.53
Cairo, Ill.	0.26
Caspar, Wyo. (pipe .835)	0.95
Cedar Rapids, Iowa, (wire .345)	0.245
Chattanooga, Tenn.	0.49
Dallas, Tex. (pipe .69) (rail and river .75)	0.84
Denver	0.83
Des Moines, Iowa	0.295
Detroit	0.275
Grand Rapids, Mich.	0.255
Green Bay, Manitowoc, Wis.	0.205
Indianapolis (pipe .25)	0.18
Kalamazoo, Mich.	0.22
Kansas City (pipe .35)	0.42
Madison, Wis.	0.14
Memphis, Tenn. (all rail)	0.38
Memphis, Tenn. (rail and river)	0.315
Milwaukee	0.095
Minneapolis-St. Paul	0.2275
Muskogee, Okla. (pipe .60)	0.69
New Orleans (all rail)	0.55
New Orleans (rail and river)	0.455
Omaha, Nebr. (pipe .35)	0.42
Pacific Coast (tin plate .75)	1.00
Rock Island, Ill.	0.17
St. Joseph, Mo. (pipe .35)	0.42
South Bend, Ind. (sheets .13)	0.125
St. Louis	0.22
Tulsa, Okla. (pipe .60)	0.69

CLEVELAND TO:

Akron, O.	$0.09
Atlanta	0.57
Baltimore	0.37
Boston	0.43
Buffalo	0.25
Canton	0.095
Chattanooga	0.50
Chicago	0.30
Cincinnati	0.27
Columbus	0.215
Detroit (rail)	0.235
Indianapolis	0.28
New Orleans	0.65
New York	0.40
Philadelphia	0.38
St. Louis	0.36
Toledo	0.20

YOUNGSTOWN TO:

Akron, O.	$0.095
Baltimore	0.345
Beaumont, Tex. (pipe .67)	0.87
Boston	0.405
Buffalo	0.25
Canton	0.095
Caspar, Wyo.	1.15
Chattanooga	0.50
Chicago	0.32
Cincinnati	0.285
Cleveland	0.095
Columbus	0.25
Dallas (pipe .855)	1.02
Denver (pipe 1.115 Min. 60,000 lbs.)	1.13
Detroit	0.265
Indianapolis	0.30
Little Rock, Ark. (pipe .75)	0.70
Memphis	0.54
New Orleans	0.66
New York	0.375
Pacific coast	1.15
Philadelphia	0.355
Shreveport, La. (pipe .84)	0.79
Smackover, Ark. (pipe .82)	0.77
St. Louis	0.38
Toledo	0.24
Tulsa, Okla. (pipe .855)	0.87

LORAIN TO:

Atlanta	$0.57
Bakersfield, Long Beach and Los Angeles	1.15
Beaumont, Tex.	0.655
Caspar, Wyo.	1.125
Chattanooga	0.50
Chicago	0.36
Cincinnati	0.265
Cleveland	0.07
Coffeyville, Kans.	0.70
Dallas	0.84
Detroit	0.215
New Orleans	0.65
*Shreveport, La.	0.76
Smackover, Ark.	0.77
St. Louis	0.355
Tulsa, Okla.	0.84
Wichita	0.84

*Minimum 80,000 pounds.

FROM / TO	SPARROWS POINT	BETHLEHEM	COATESVILLE	PITTSBURGH	BUFFALO
Massachusetts Points..	25.5	25.5	25.5	36.5	33.0
Connecticut Points	25.5	25.5	25.5	36.5	33.0
Albany, N. Y.	22.5	22.5	22.5	34.0	21.5
Troy, N. Y.	22.5	22.5	22.5	34.0	21.5
Schenectady, N. Y.	22.5	22.5	22.5	34.0	21.5
Syracuse, N. Y.	22.5	22.5	22.5	28.5	17.5
Rochester, N. Y.	22.5	22.5	22.5	26.5	11.5
Buffalo	32.0	32.0	32.0	26.5	.....
Erie, Pa.	30.5	31.0	31.0	22.0	13.5
New York City	19.0	14.5	17.5	34.0	32.0
Brooklyn, N. Y.	19.0	14.5	17.5	34.0	32.0
Newark, N. J.	19.0	14.5	17.5	34.0	32.0
Plainfield, N. J.	19.0	14.5	17.5	34.0	32.0
Bethlehem, Pa.	19.0	.....	17.5	32.0	32.0
Allentown, Pa.	19.0	3.0	17.5	32.0	32.0
Reading, Pa.	15.5	13.0	10.0	32.0	32.0
Lancaster, Pa.	14.5	17.5	9.0	32.0	32.0
Wilkes-Barre, Pa.	19.0	13.0	19.0	32.0	28.0
Pottstown, Pa.	15.5	14.5	10.0	32.0	32.0
Berwick, Pa.	19.0	19.0	19.0	32.0	28.0
Milton, Pa.	19.0	19.0	19.0	31.0	28.0
Ambler, Pa.	19.0	13.0	15.5	32.0	32.0
York, Pa.	14.5	19.0	12.5	31.0	32.0
Scranton, Pa.	19.0	13.0	19.0	32.0	28.0
Philadelphia	14.5	13.0	10.0	32.0	32.0
Baltimore	6.0	19.0	14.5	31.0	32.0
Hagerstown, Md.	19.0	22.5	22.5	31.0	32.0
Richmond, Va.	21.5	28.5	24.0	38.0	38.0
Newport News, Va.	21.5	28.5	24.0	38.0	38.0
Charlotte, N. C.	40.5	44.0	43.0	51.0	53.0

Pig Iron

In gross tons

BIRMINGHAM, ALA., TO:

Boston (rail and water)	$6.91
Chicago	6.01
Chicago (rail and water)	4.18
Cincinnati	6.01
Jersey City, N. J.	8.05
Louisville, Ky.	3.39
New York	9.24
Philadelphia (rail and water)	6.01
St. Louis	4.42

EVERETT, MASS., TO:

Claremont, N. H.	$2.52
Hartford, Conn. (plus $5 per car for switching to New Haven tracks)	2.90
New Haven, Conn.	3.30
Pittsfield, Mass.	2.65
Portland, Me.	2.39
Providence, R. I.	2.10
Rutland, Vt.	2.65
Springfield, Mass	2.27
Worcester, Mass.	1.89

PORT HENRY, N. Y. TO:

Boston (New Haven R. R. $3.65)	$3.15
Claremont, N. H.	3.65
Hartford, Conn.	3.65
New Haven, Conn.	3.28
Pittsfield, Mass. (New Haven R. R. $3.65)	3.00
Portland, Me.	3.65
Rutland, Vt.	1.39
Providence, R. I.	3.65
Springfield, Mass. (New Haven R. R. $3.65)	3.00
Worcester, Mass.	3.15

CHICAGO TO:

Des Moines, Iowa	$3.75
Milwaukee	1.00
Minneapolis, St. Paul	3.04
Moline, Ill.	1.76
Omaha, Nebr.	4.97
St. Louis	2.16

CLEVELAND TO:

Cincinnati	$2.90
Columbus, O.	2.10
Dayton, O	2.52
Springfield, O.	2.39
Canton, O.	1.26
Akron, O.	1.26
Youngstown, O.	1.76
Crestline, O.	1.76
Lima, O.	2.39
Mansfield, O.	1.76
Detroit	2.75
Indianapolis	3.30

TOLEDO, O. TO:

Cincinnati	$2.65
Columbus, O.	2.10
Dayton, O.	2.27
Springfield, O.	2.07
Canton, O.	1.77
Akron, O.	2.25
Youngstown, O.	2.65
Lima, O.	1.68
Mansfield, O.	1.76
Detroit	1.00
Indianapolis	2.96
Battle Creek, Mich.	2.40
Flint, Mich.	2.10
Jackson, Mich.	1.90
Grand Rapids, Mich.	2.90
Kalamazoo, Mich.	2.65
Lansing, Mich.	2.10

DETROIT TO:

Indianapolis	$3.15
Toledo, O.	1.00
Springfield, O.	2.61
Dayton, O.	2.90
Jackson, Mich.	1.90
Battle Creek, Mich.	2.40
Flint, Mich.	1.85
Grand Rapids, Mich.	2.90
Kalamazoo, Mich.	2.65
Lansing, Mich.	1.95

BUFFALO TO:

Albany, N. Y.	$2.27
New England (rail)	4.91
New York (rail)	4.91
Philadelphia	4.91
Rochester, N. Y.	1.39

TROY, N. Y. TO:

Boston	$2.90
Worcester, Mass.	2.65
Springfield, Mass.	2.39
Providence, R. I.	3.66
Hartford, Conn.	3.66
New Haven, Conn.	4.10
Claremont, N. H.	2.65
Portland, Me.	3.15

The Enduring

Anti-Friction Mill Motors

The anti-friction bearings which are capably carrying the rolls in great steel mills, are the anti-friction bearings for your mill motors. Endurance never believed possible is assured by the extra radial load area of Timken Tapered Roller Bearings, the full thrust capacity, the true rolling motion, and the perfect seal.

Mill motors require more than anti-friction characteristics. The necessary rigidity, simplicity and compactness are inherent in Timken mountings. They preserve the gap permanently. A negligible amount of lubrication is all it takes to insure Timken-powered mills against the high cost of motor failure.

These tremendous savings are yours when you specify Timken Bearings in the motors you buy from any leading maker.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN

Tapered

ROLLER BEARINGS

Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS*, and Timken electric steel provide self-contained capacity for extreme radial load, thrust, shock and speed

DOUBLE ROW SELF-CONTAINED TIMKEN BEARING

SINGLE ROW TIMKEN BEARING

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. These preferentials increased by one extra 5 per cent in meeting competition.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Weld)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2¼-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier	

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot,	.20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B.	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection	No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra	.10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra	.20c